COTTON

Volume 84
Number Two
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DECEMBER, 1919

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Dalton, and Atlanta, Ga.

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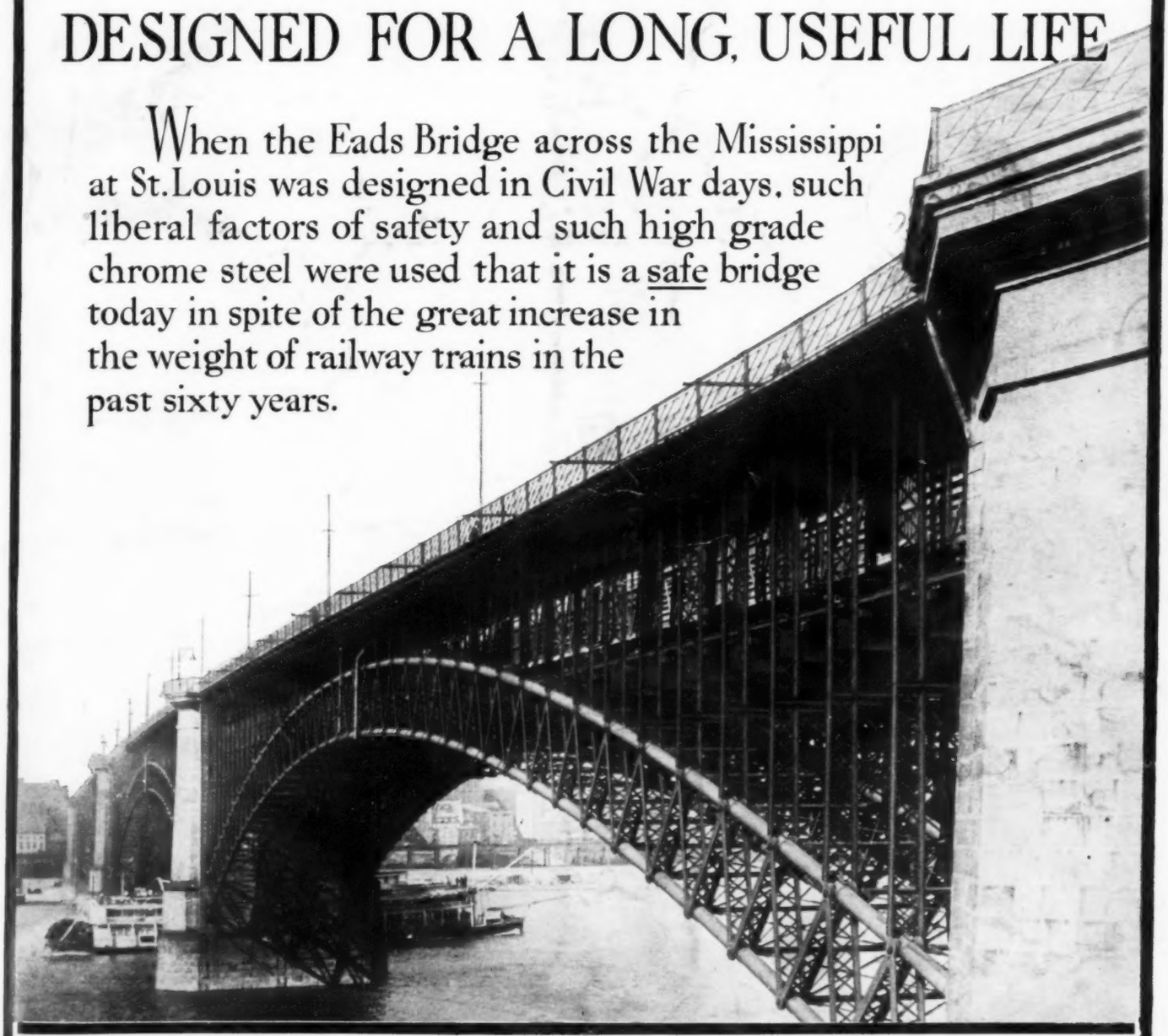
DESIGNED FOR A LONG, USEFUL LIFE

When the Eads Bridge across the Mississippi at St. Louis was designed in Civil War days, such liberal factors of safety and such high grade chrome steel were used that it is a safe bridge today in spite of the great increase in the weight of railway trains in the past sixty years.



Textile Machinery equipped with durable, chrome-vanadium steel Hyatt Roller Bearings gives many years of useful service without bearing replacement.

Such service pays—pays you.

Send for complete information on how Hyatt Roller Bearings can make your Textile Machinery of greater value to your customers.

HYATT ROLLER BEARING COMPANY, Metropolitan Tower, NEW YORK, N. Y.

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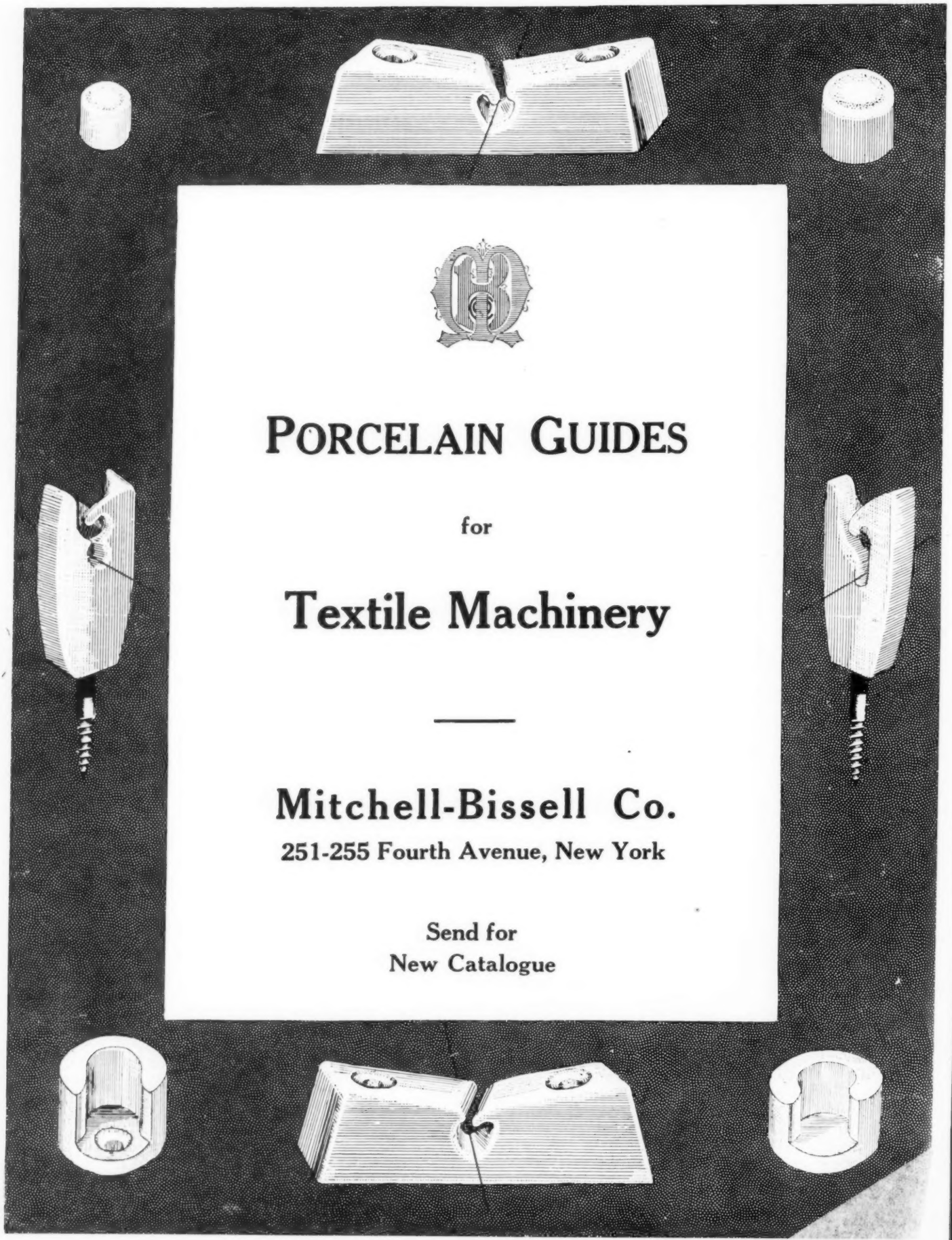

PORCELAIN GUIDES
for
Textile Machinery
Mitchell-Bissell Co.
251-255 Fourth Avenue, New York
Send for
New Catalogue

NORTHROP

TRADE-MARK

LOOM REPAIRS

OUR loom repairs are made from the same patterns as the parts that they replace on the Northrop looms; they are machined with the same tools, jigs and fixtures; they are made from the same high grade materials

Repairs made under our conditions **ARE** better than those made in job foundries and shops and without our interest in the working of the Northrop loom

Draper Corporation service goes with our goods

Our prices for loom and other repairs are low

We carry several hundred tons of Finished Loom repairs in stock for the convenience of our customers

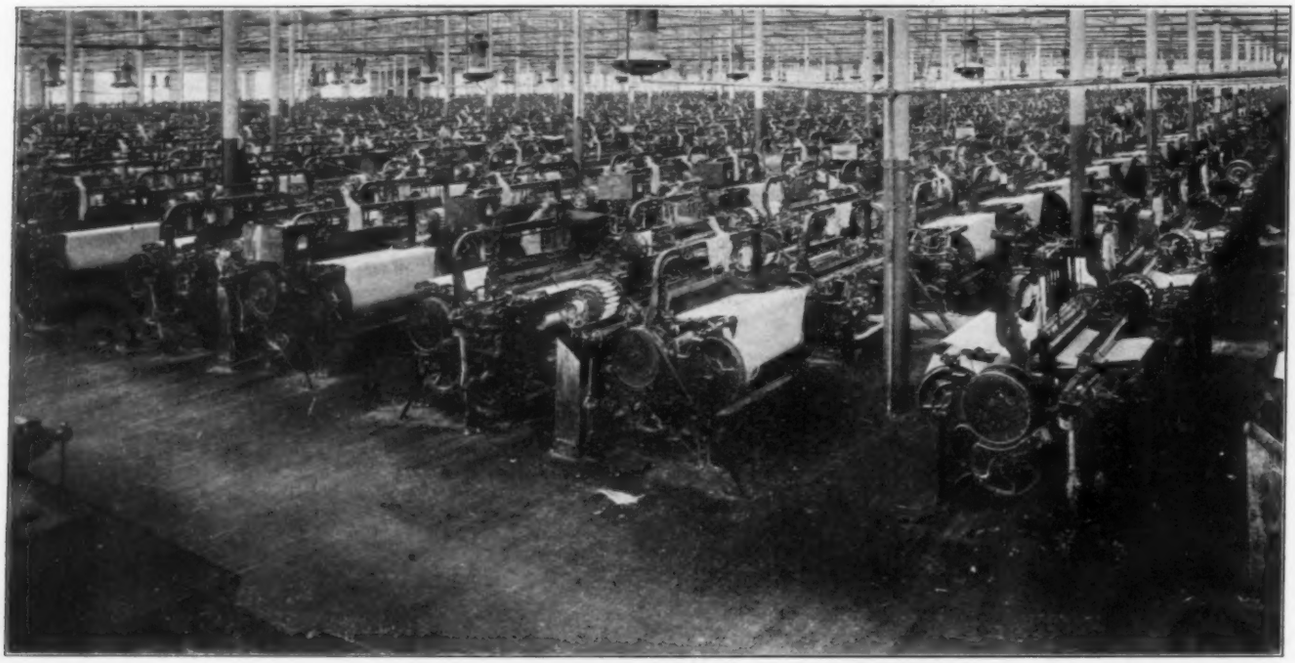
DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

Southern Office:
188 South Forsyth Street Atlanta Georgia

Copyright 1917 by Draper Corporation

SAYS THE WISE MAN TO HIS



View of Weaving Room

LANETT COTTON MILLS, WEST POINT, GA.

The power to drive these Looms is Furnished thru

HYATT ROLLER BEARING HANGERS

on the Floor below.

HYATT BEARINGS

MACHINES "MORE POWER TO YOU"

The far sighted man who says "More power to you" to his machines and gives them more power gets his reward in greater production—$500 greater per year for each horse power.

The thing most needed if you are to get greater production from your mills is more power.

More power delivered to the machines.

You can get more power by:

1. Increasing your power plant—expensive.
2. More economical distribution of your present power—effective.

Every horse power that you can save by economical distribution of your power will produce $500 worth of textiles every year.

It is therefore worth money—real money to you to give careful consideration to a sure means of saving power

Hyatt Roller Bearing Hangers will save **at least** 15 per cent of your total power.

Which means that the use of Hyatt Roller Bearing Hangers on your line shafts will make possible an increase of **at least** 15 per cent of your total production (salable goods) without the use of an extra shovel of coal or an extra pound of water.

Can you afford to put off installing Hyatt Roller Bearing Hangers? Send for complete engineering data.

MOTOR BEARINGS DIVISION
DETROIT, MICHIGAN

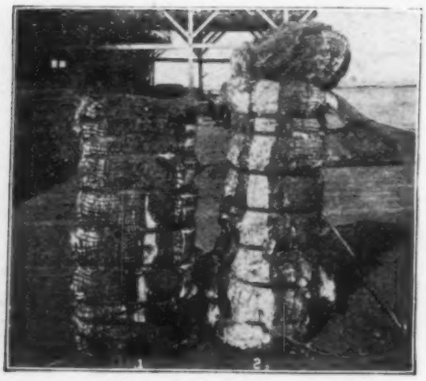
HYATT ROLLER BEARING COMPANY
INDUSTRIAL BEARINGS DIVISION
METROPOLITAN TOWER, NEW YORK

TRACTOR BEARINGS DIVISION
CHICAGO, ILLINOIS

Manufacturers of Bearings for Mine Cars, Ore Cars, Steel Mill Cars, Roller Tables, Trolleys, Cranes, Hoists, Machine Tools, Line Shafts, Countershafts, Concrete Machinery, Textile Machinery. Conveyors, Lift Trucks, Industrial Trucks, Railway Service Cars, Storage Battery Locomotives, etc.

FOR LINE SHAFTS

Uniform Bales 50% Greater Density

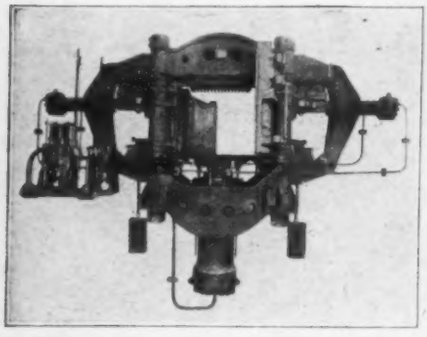


1. Southwark-Standard bale—each side rectangular. 2. Old style bale—with bulging ends.

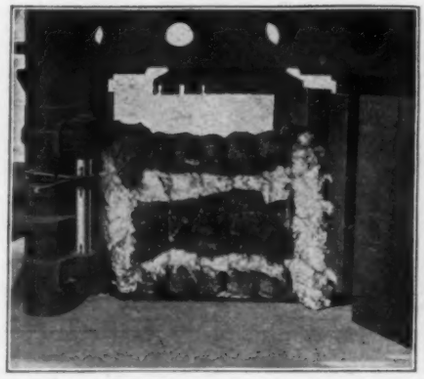
Although, under the old method, a temporary density of 50 to 55 lbs. per cubic foot is reached at the blow, an average density of only 22 or 23 lbs. remains after the bale is bound.

With final pressure of only 450 tons, the Standard 3-Ram Hydraulic Compress produces greater remaining density than the 2000-ton smash of the old style one ram steam compress.

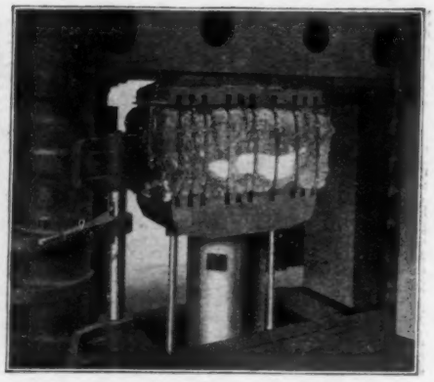
SOUTHWARK STAND-



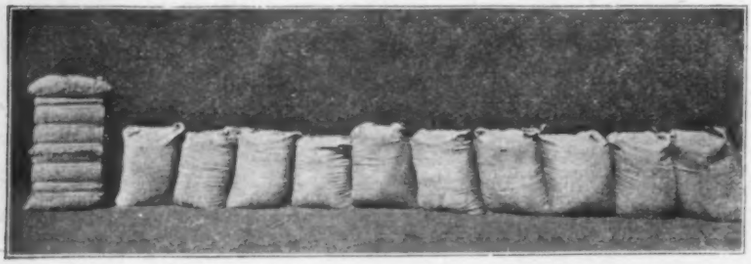
Improved Southwark-Standard Compress with outside ram packing. (Patented.)



Gin bale ready to receive hydraulic pressure from five sides.



Greatest pressure of 450 tons makes density of 32 to 36 lbs. per cubic foot.



A Southwark-Standard bale of rice hulls—equivalent of ten bagfuls.

Protecting Ameri-

Overseas spinners call the old style American cotton bales "the worst in the world." Consequently Indian, Egyptian and Chinese cotton fields are being exploited to America's disadvantage.

If America wants to maintain or increase its sales of cotton in Europe, our cotton must be properly baled, or Africa and the Orient will diminish our markets.

SOUTHWARK FOUNDRY

PHILADELPHIA, PA.

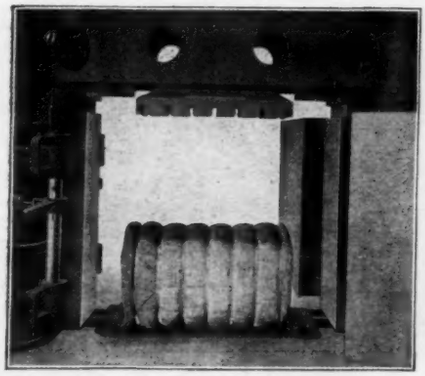
—No Wastage 75% Less Pressure

By assembling the cotton from five sides by means of three hydraulic rams, and holding the density while binding the bale, under the Southwark-Standard process the final density of 32 to 36 lbs. is but slightly less than when under actual pressure.

Hence, the fibre is not injured and the bales are uniformly compact and perfectly rectangular in shape and uniform in size.

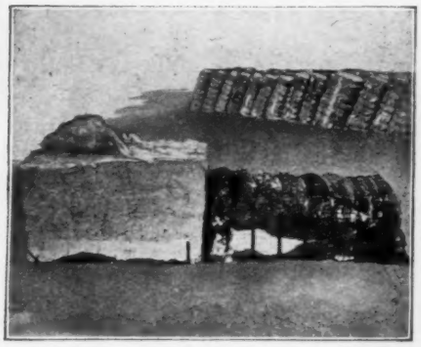
ARD COMPRESS (HYDRO ELECTRIC)

Bales made in multiples of car dimensions reduce freight charges.



This press has maintained an average of 60 bales an hour—all same shape and size.

Southwark-Standard bales (at right of two old style bales) double storage capacity at piers, etc.

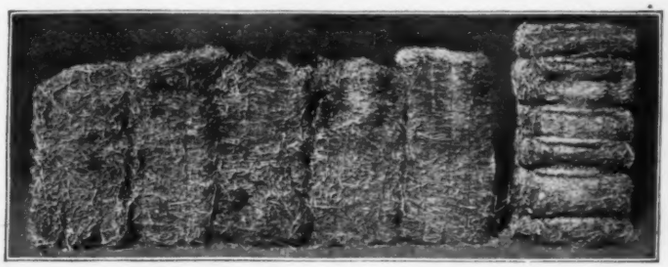


Showing resiliency of Southwark-Standard bale when opened—cotton uninjured.

ca's Cotton Industry

So it's more than a matter of conserving space, reducing freight rates, and preserving the superior quality of American cotton: it's a matter of holding your markets, both here and abroad.

The Southwark-Standard uniformly compact, rectangular shaped, high-density-low-pressure bales mark the dawn of a new era for America's cotton industry.

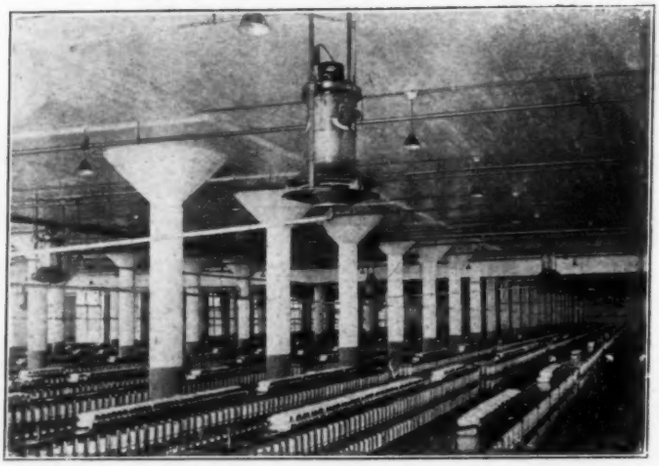


A Southwark-Standard bale of hay—from five ordinary bales.

& MACHINE COMPANY

BRANCH OFFICE AT BIRMINGHAM, ALA.

Modern Methods in Humidification



As applied to this big Spinning Room. This mill has 72 cards, 42,000 Spindles, 1100 Looms

This is the day of better building in all lines—the day of efficiency—the day of specialists.

Mills that have bought humidifying apparatus during the past twenty-five or thirty years have not been buying on a scientific basis—not always on a common sense basis. The result is their apparatus is not up to modern requirements.

Any humidifying system is better than none at all, but at a conservative estimate 75 per cent of those now running are inadequate in capacity—not positively controlled—do not contain many necessary features required in present day textile manufacturing.

Parks-Cramer — specialists in humidification—offer you not only originality and modern efficiency in every air conditioning equipment, but the services of their engineers who undertake your whole problem of humidifying, heating, process and power piping. You get all the advantages incident to consolidation of all problems into one—one set of workmen —one house to deal with. Service—satisfaction—up-to-the-minute efficiency.

Parks-Cramer Company

Fitchburg **Boston** **Charlotte**

Buy your looms on a cost-per-yard basis

THERE are two ways of buying looms.

You can buy a loom in payment for which you will sign the smallest check

or

you can buy a loom for which you will sign the fewest upkeep checks—and receive the most dividend checks—a loom whose output will be a standard one because it will produce material at the lowest cost per yard.

Every Fletcher Loom is made with a view to performance, that is, to its ability to run continuously for a long term of years without lessened production. It is designed with a view to the cost per yard of producing materials, that means ease of operation, accessibility, and a minimum of attention from the operator.

Ask for the rest of the story.

FLETCHER WORKS

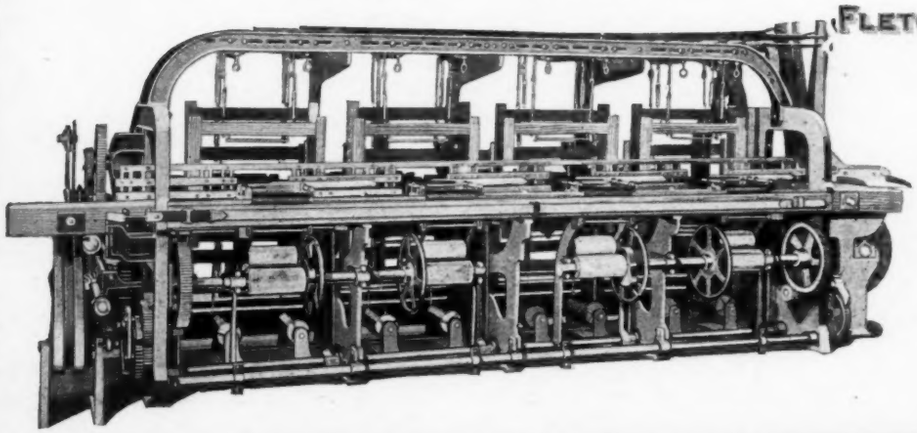
Formerly Schaum & Uhlinger
Glenwood Ave and 2nd Street
Philadelphia, U.S. A.

Eastern Agent
A. J. CADY
304 National State Bank Bldg.
Troy, N. Y.

Southern Agent
STUART W. CRAMER
Charlotte, N. C.

Western Agent
R. R. STREET & CO.
541 West Washington St.
Chicago, Ill.

Southern Representative
HOWARD MORSHEAD
Glenwood Ave., at Second St.
Philadelphia, Pa.



FLETCHER WORKS

Cotton Belting Loom

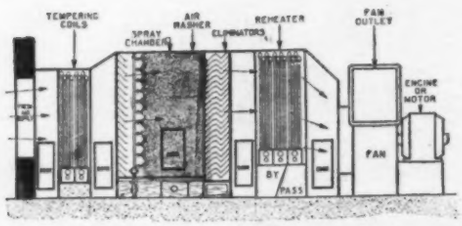
Note handwheel of differential gear take-up. The ample purchase of the handwheel makes it easy for the operator to take up or let back the fabric at will, at the same time that the fabric is held secure in any position.

F-L-101B

Sturtevant
(REG·U·S·PAT·OFF·)

AIR CONDITIONING SYSTEMS

Boom Production in Textile Mills!



Typical Sturtevant Heating, Ventilating, and Air Conditioning System

Unfavorable climatic conditions **inside** textile mills cause innumerable yarn breaks with their resultant delays and shutdowns. "Fly" or "Fluff" saturated atmospheres are detrimental to the health of employees and promote inefficiency. In each case **production suffers!** A "climate doctor" is needed!

Specify Your Ideal climate and we will Guarantee to Furnish it 365 Days in the Year

REGARDLESS of *outside* weather our "climate doctors" and "air specialists" will make every day an *ideal day inside* your plant—for your material—your manufacturing process—and your employees. Countless industries are already successfully and economically operating Sturtevant Air Conditioning systems. In textile mills we get at the heart of yarn breaks by eliminating static electricity. We furnish a cool, dry climate in summer; warm, moist climate in winter. Humidity and temperature are under easy control and can be regulated at will. Request our engineering department to study your plant and submit a plan and an estimate of your needs. No obligation incurred. Write the nearest of our twenty-three Sales Engineering Branches.

is the symbol of the W. L. Fletcher Co., engineering experts in the design and installation of Air-Conditioning Systems.

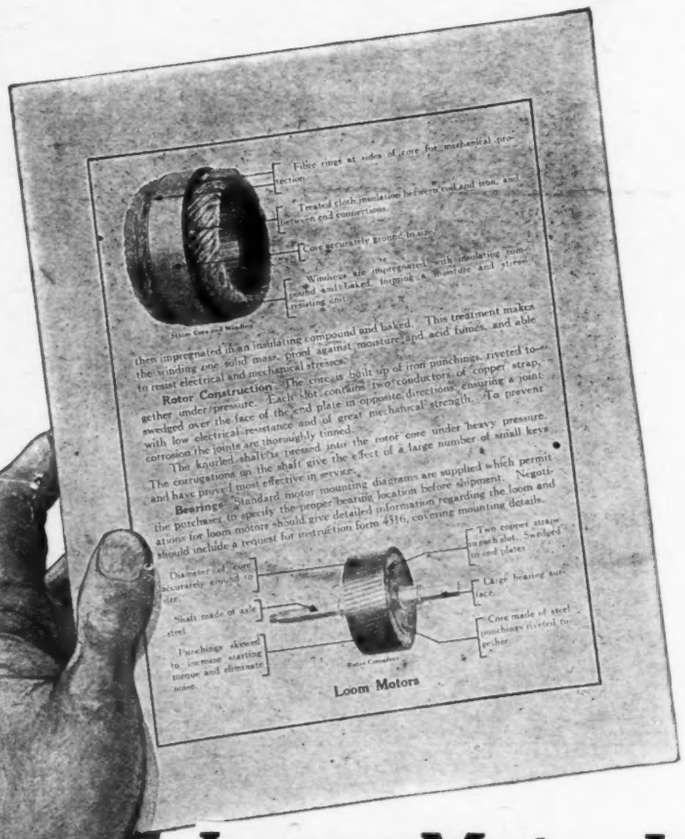
For greater strength and efficiency Sturtevant multivane fan wheels have patented cup-shaped vanes which enable Sturtevant multivane fans to deliver largest volumes of air at smallest cost.

B. F. STURTEVANT COMPANY

HYDE PARK, BOSTON. MASS., AND ALL PRINCIPAL CITIES

Sturtevant
PUTS AIR TO WORK

Good Construction Is The Backbone Of Good Operation—



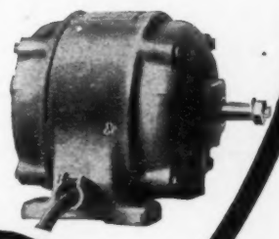
Say what we may, we can't get away from the fact that good construction is essential to good loom motor operation.

It often happens that the least noticeable details of design are of first importance from the standpoint of uninterrupted operation and low maintenance cost.

Loom Motor Leaflet 1292

A customer once said, "An incident has come to my attention that convinces me it was well worth my while to carefully review your construction leaflet. Developments have confirmed the choice it enabled me to make from a construction standpoint.".

Leaflet 1292 will convince any textile man of two things (1) That the engineers who designed the Westinghouse Loom Motor knew what is required of such a motor, and (2) that nothing has been left undone to fit it for loom motor requirements.



Westinghouse Electric & Manufacturing Co.,
East Pittsburgh, Pa.

W
WESTINGHOUSE ELECTRIC

Westinghouse

SACO-LOWELL CARD STRIPPER

DUSTLESS AND AUTOMATIC

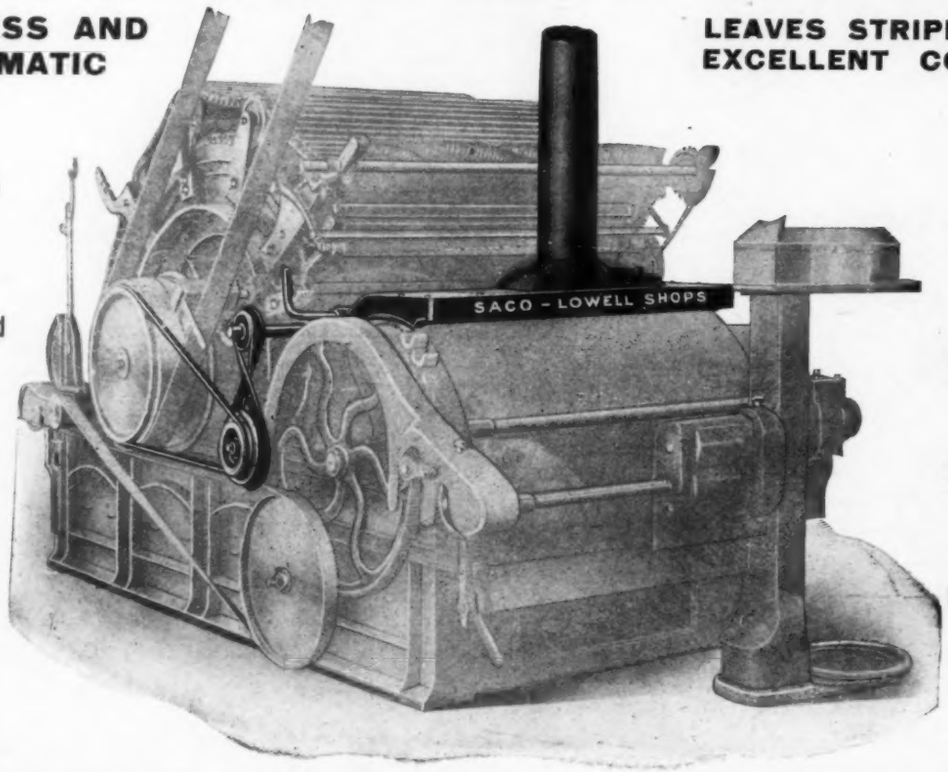
LEAVES STRIPPINGS IN EXCELLENT CONDITION

Economical to Operate

Saves Time and Labor

Strips Card Clean

Sanitary and Efficient



Low Cost of Maintenance

Simple, Durable Practical

Control Always Absolute

Full Information Furnished

Rogers W. Davis, Southern Agent CHARLOTTE, N. C. **Saco-Lowell Shops, Newton Upper Falls, Mass.** Southern Branch Office GREENVILLE, S. C.

Thacker Warp Stop Motion Frame

Attachment used whereby open drop wires can be drawn in at frame and transferred to loom as readily and safely as are the closed drop wires

We Offer to the Trade a New Bobbin Stripper for Automatic Loom Bobbins.

Crompton & Knowles Loom Works

Worcester, Mass.

Providence, R. I. Philadelphia, Pa. Paterson, N. J.

Southern Representatives---Alexander & Garsed, Charlotte, N. C.
South American Representatives---W. R. Grace & Co., New York

"Sirocco"
TRADE MARK.

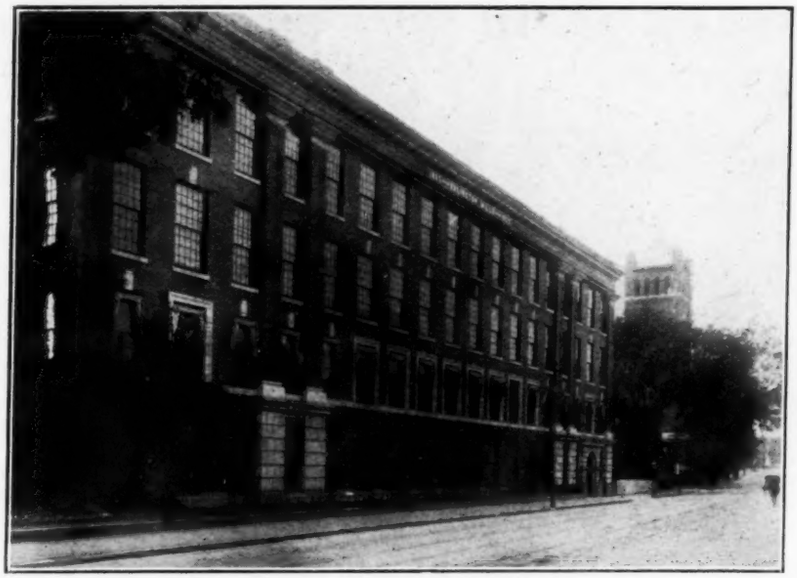
FOR THE TEXTILE MILL

In many of the leading textile mills, the question of ventilating and air conditioning has been solved with satisfaction and profit.

In the Arlington Mills, shown here, a better quality of products, improved working conditions and satisfied employes are the result of the study made whereby the right kind of air is furnished every hour of the day thruout this big plant.

Whether it is equipment for the handling of cotton, or fans, blowers or air conditioning apparatus for the textile field, we are in a position to furnish the kind of equipment which experience has proven to be best suited to the particular needs.

If you are contemplating any additions to your plant or if there is any point at which ventilation enters which you would like to talk over with us, we would be glad to have you get in touch with us. One of our sales engineers located near you will be glad to cooperate to the fullest extent.



Arlington Mills
Lawrence, Mass.
users of "Sirocco" products

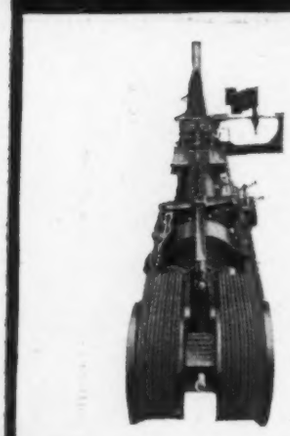
American Blower Company

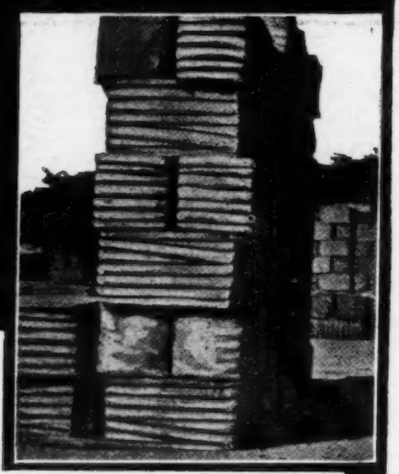
Detroit, Mich.

Canadian Sirocco Co., Ltd.
Windsor, Ont.

Branches in All Large Cities.

HIGH DENSITY BALING PRESS





A Press of Enormous Capacity

Cummin's New Patent Horizontal Cotton Baling Press for High Density End-Pressed Bales consists of a horizontal hydraulic press of enormous capacity as compared with any press of the present day.

56 pounds per cubic foot is the density obtained by the Cummins' bale as compared with an average of 22 pounds by the present methods employed in this country.

The Merchant Sample Machine is supplied with each press at a very nominal price. With these machines samples can be drawn from any bale of any desired weight without the necessity for re-pressing.

On the left is shown the cotton bale in machine, samples being drawn of any desired weight.

On the left cotton bale in machine, after sampling. Re-hooped with original hoop, and fit for shipment as before.

We shall be glad to confer with those interested in the future of America's cotton exports, giving them the benefit of our long experience in High-Density baling. Write for catalogue.

W. D. Crumpton

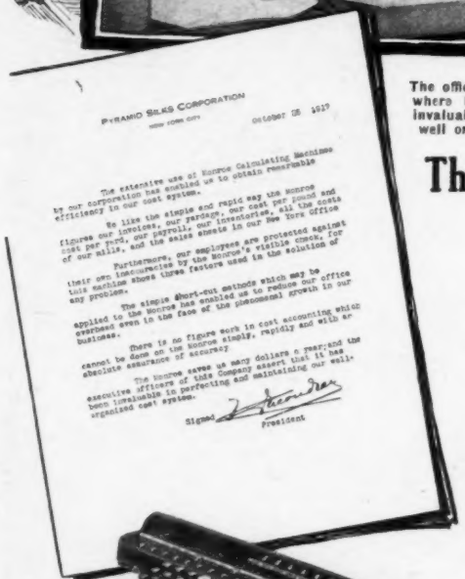
American Representative

29 Broadway, New York, N. Y.

DAVID BRIDGE & CO LTD
MANCHESTER ENGLAND

The leading Textile Manufacturers of the Country place the burden of all their figure-work on the Monroe Calculating Machine

The office of the Pyramid Silks Corporation where where Monroe Calculating Machines have proved invaluable in perfecting and maintaining their well organized cost system.



PYRAMID SILKS CORPORATION

NEW YORK CITY. October 15 1919

The extensive use of Monroe Calculating Machines by our corporation has enabled us to obtain remarkable efficiency in our cost system.

We like the simple and rapid way the Monroe figures our invoices, our yardage, our cost per pound and cost per yard, our payroll, our inventories, all the costs of our mills, and the sales made in our New York office

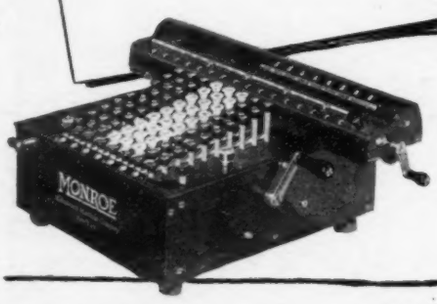
Furthermore, our employees are protected against their own inaccuracies by the Monroe's visible check, for any problem.

The simple short-cut methods which may be applied to the Monroe has enabled us to reduce our office overhead even in the face of the phenomenal growth in our business.

There is no figure work in cost accounting which cannot be done on the Monroe simply, rapidly and with absolute assurance of accuracy.

The Monroe saves us many dollars a year and the executive officers of this Company assert that it has been invaluable in perfecting and maintaining our well organized cost system.

Signed ..... President



The MONROE Does More than Simply Reduce Mistakes—it eliminates them

NO matter what type of figure-work—yardage, payrolls, mill costs, sale sheets, inventories, etc.—you can figure them easily and quickly on the **MONROE**, because *it not only Adds, but Multiplies, Divides and Subtracts as easily as other machines add.* The ***two-way mechanism*** of the machine marks the simplicity of figuring on this *four-in-one* machine; a forward turn for Addition and Multiplication and backward turn for Subtraction and Division.

But of greater importance than speed is the assurance of absolute accuracy of your answers. This feature is made possible by the MONROE Visible Check of Accuracy, which enables you to *prove* and *check* your figures as you go along. And last, but not least, is the flexible keyboard, which enables the operator to detect and correct an error in depressing a key *before* the error enters in the machine.

Let us prove to you by actual demonstration in your office on your own work how the MONROE can save you time labor and money in doing all your figure-work. There's no obligation attached. Use the coupon.

Monroe Calculating Machine Co.

Woolworth Building **New York City**

Offices in Principal Cities

The "SHOW ME" Coupon Mail it Today

To Monroe Calculating Machine Company

Woolworth Building, New York

Without obligating us
(Check item desired)

☐ Send a copy of your folder: "**Cutting the Cost of Cloth Construction.**"

☐ Arrange for a demonstration in our office on our own work.

Firm Name .....

Your Name .....

Address .....

C-12-19

MONROE CALCULATING MACHINE

WHITIN MACHINE WORKS

ESTABLISHED 1831

TEXTILE MACHINERY

Manufacturers

of

HANK CLOCKS
for all makes

of

Combing, Drawing, Roving,
Spinning and Twisting
Machines.

Correspondence Solicited.

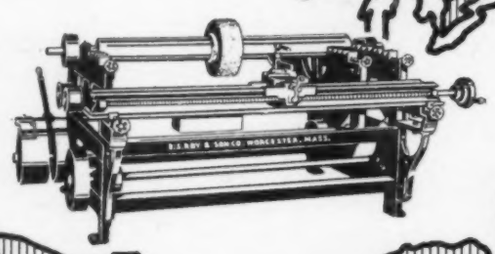
MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE N.C.

B. S. ROY & SON CO. EST. 1868

MADE IN AMERICA



SHIPPED THE WORLD OVER

TEXTILE GRINDING MACHINERY WORCESTER, MASS., U.S.A.

Recognized as the Standard

WE ARE grinder specialists giving our entire time to the manufacture of one thing—GRINDERS.

That is why Roy Grinders are recognized as the standard.

Our position in the industry which we attained by over fifty years of specialization on such machines permits no compromise.

By countless experiments and the embodiment of every improvement in our grinders that these tests have proven we believe we are now offering mill men the highest type of Card and Napper Roll Machines it is possible to produce.

The hearty endorsement of mills which lead the Textile Industry is conclusive evidence of Roy Efficiency and Service

B. S. ROY & SON CO.,
Worcester, Mass.
ESTABLISHED 1868.

Roy Grinders

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His bill is the biggest one you pay—

See that it's right

With wages higher and working hours shorter than ever before, accurate timekeeping, cost accounting and payroll computing are vital necessities of business.

These factors protect the employer. They also safeguard the employee by insuring him of reliable, impartial time records—which in turn guarantees fair payrolls.

International Time and Cost Recorders

—mechanically operated by the workers themselves—take all the guesswork out of timekeeping, cost figuring, and payroll preparation. Their records are simple, complete, clearly-printed—always accurate.

International Time Recorders show how much time each worker spends in the plant each day.

International Cost Recorders **show what each worker accomplishes—job by job—while he is there.**

That Vitally Important Story

is explained clearly and briefly—it doesn't require much explaining—in hard-fact literature which we will be glad to send you on request. Write us today.

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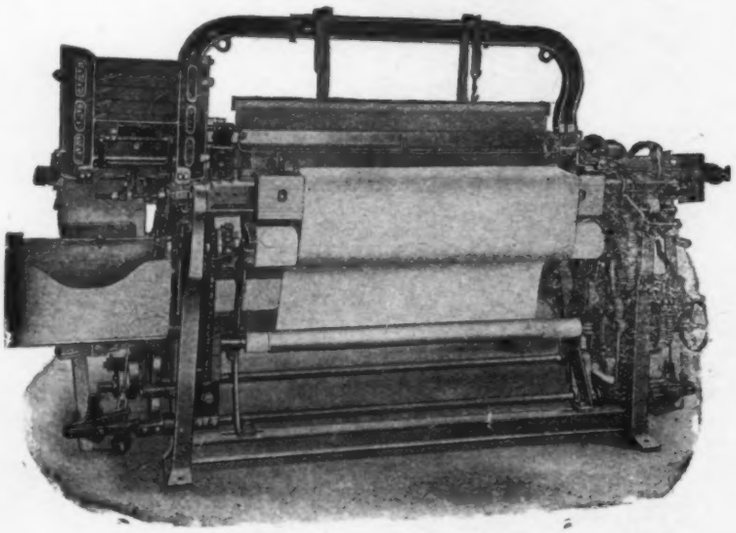


THE STAFFORD Automatic Loom stands for low operating cost and high quality of fabrics.

It has the widest scope of any automatic loom and can be easily changed over from one fabric to another.

And remember that while saving 50% to 60% in weaving costs for you the weavers can earn from 40% to 50% more wages.

Write for illustrated catalog.

The Stafford Company

Readville, Mass.

J. H. MAYES, Southern Agent

1112 Independence Building, Charlotte, N. C.

Over 200 Cotton Mills Are Using

THE FUN-FUL LINE
PLAYGROUND EQUIPMENT

Because It's An Investment That Solves Labor Problems and Increases Production

The question of efficient labor is of vital importance to every textile mill man.

The laboring man of the future is going to be influenced by the advantages offered him and his family by the mill—advantages that attract him and bind him to the job.

Such advantages are no longer considered or classified within the narrow limits of "Welfare Work" but are considered by the far sighted executive as an absolute necessity that will prove a paying investment.

It requires no stretch of imagination to picture the contentment and loyal feeling of employees that are provided with outdoor gymnasia and athletic goods, and nurseries and playgrounds for their families. The workers are healthier in mind and body through the use of such apparatus and they always have something to look forward to at the end of their day's arduous labor. Playgrounds for the children uplift the standard of health throughout the entire village, increasing the ability of the larger operatives to work more efficiently and contentedly.

In short, there is a reaction throughout your entire family of operatives—a reaction mentally, morally and physically that cannot help but increase individual productiveness and be profitable in dollars and cents to the mill.

FUN-FUL Playground Apparatus is already installed in over two hundred of the largest mills in the country who are finding that it's a paying investment—finding that FUN-FUL Apparatus is made to stand the use and abuse of the roughest operatives. The line includes Swings, Slides, See Saws, Ocean Waves, Giant Strides, Outdoor Gymnasia, Athletic Goods of all kinds, etc.

Ask today for complete catalog.

Important! Income Tax Exemption.

Owing to the fact that the policy of the United States Government is to encourage recreation and general welfare work among industrial employes and their families, manufacturers and other employers are authorized to deduct expenditures for such purposes from their Income Tax Returns.

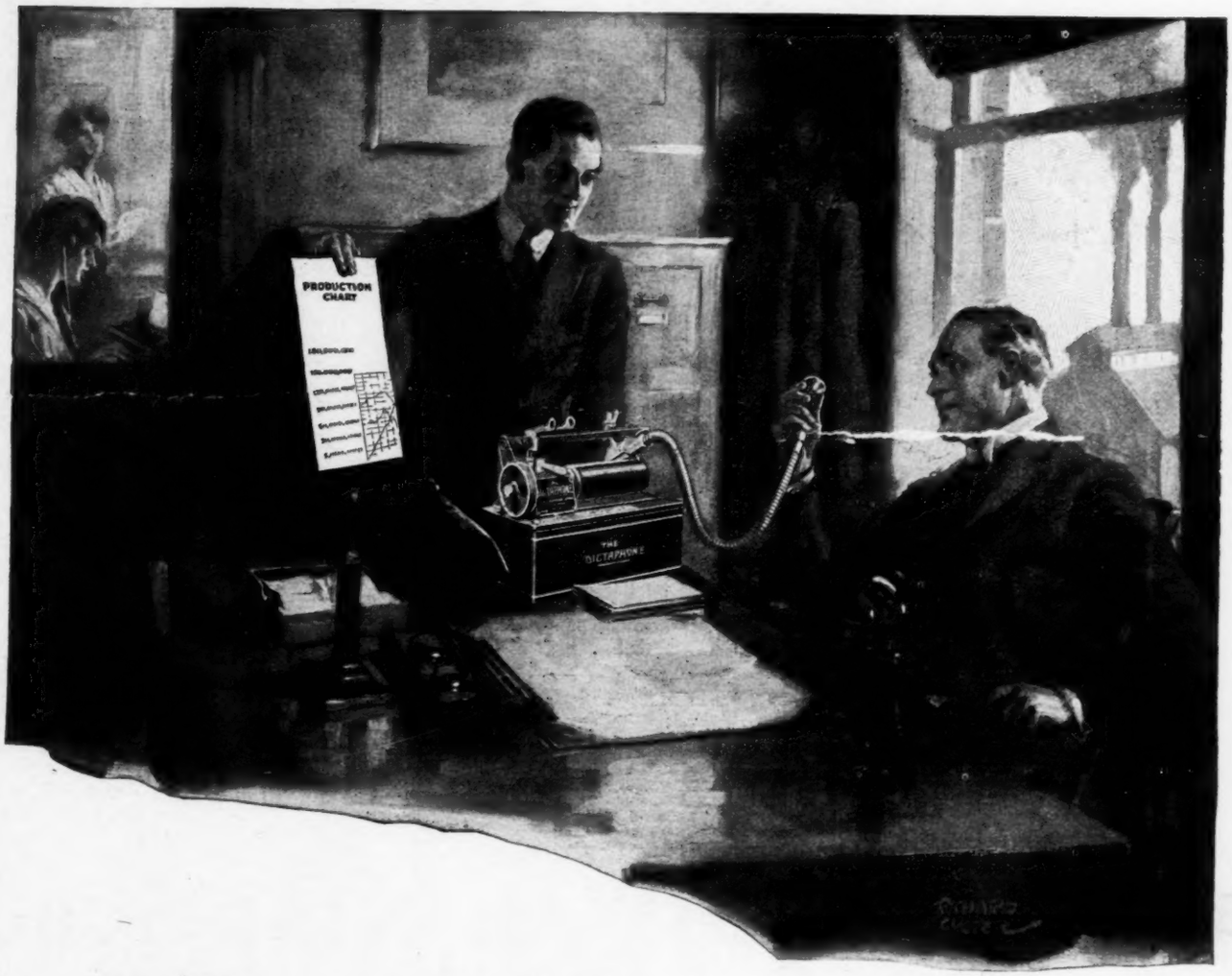
Here is a fine opportunity to equip your recreation grounds practically without expense to you.

HILL-STANDARD CO.

GENERAL SALES OFFICES, CONWAY BUILDING, CHICAGO

SOUTHERN REPRESENTATIVE-
Edward Ferger, 276 Lucile Ave., Atlanta

FACTORIES:
Anderson, Indiana, Kokomo, Indiana



A High Production Curve Means Faster Dictation

The more cotton you produce and sell, the heavier grows your correspondence, and the faster each letter and memo must be written.

With The Dictaphone always at your elbow, you stand the best chance of keeping your factory and your customers promptly informed. Phone or write for convincing 15-minute demonstration in *your* office, on *your* work. Branches in all principal cities—see your telephone book.

THE DICTAPHONE

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Atlanta	Ottawa	Vancouver, B. C.	St. John	Halifax	Calgary
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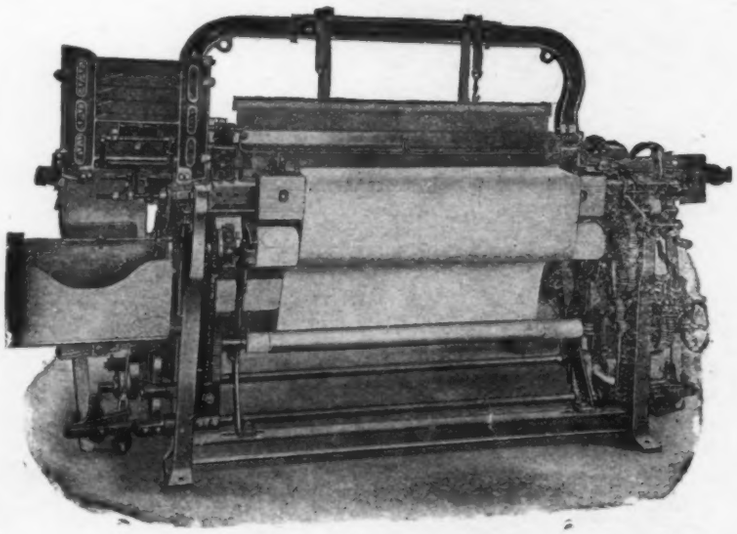
There is but one Dictaphone, trade-marked "The Dictaphone," made and manufactured by the Columbia Graphophone Company.

"The Shortest Route to the Mail-Chute"



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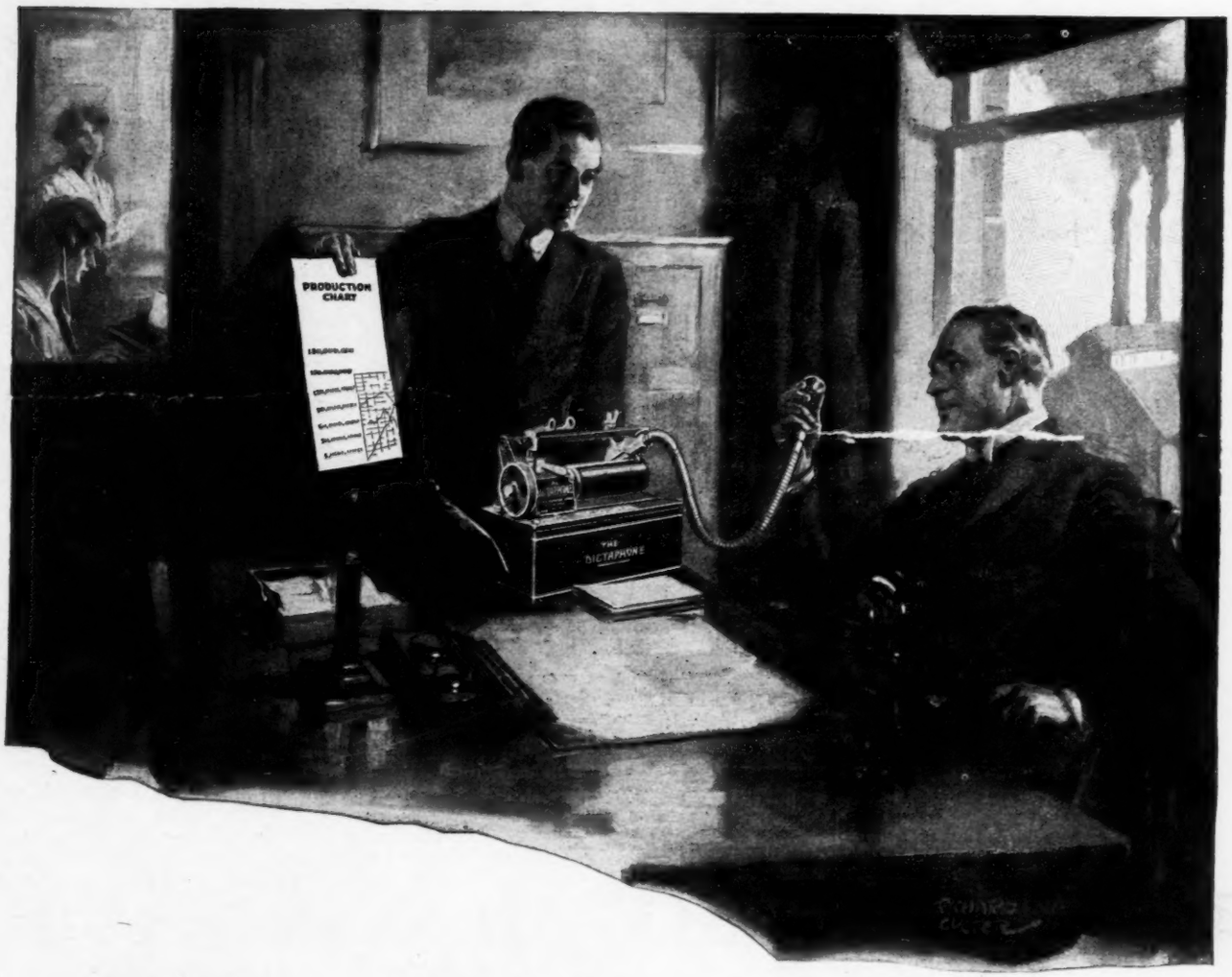

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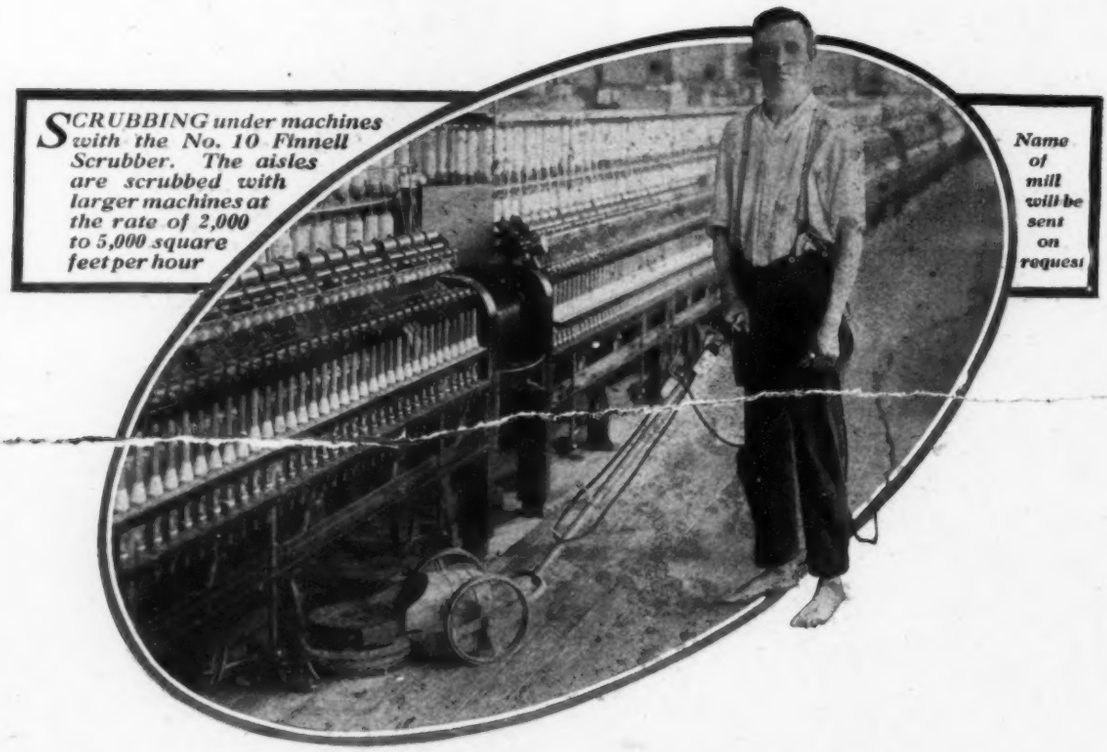
SCRUBBING under machines with the No. 10 Finnell Scrubber. The aisles are scrubbed with larger machines at the rate of 2,000 to 5,000 square feet per hour
Name of mill will be sent on request

Competing for the Honor
of Having the
Cleanest Mill in America

Last month we asked, "Which is the Cleanest Mill in America?" We printed a picture taken in a New England mill showing how clean the floors are kept.

This month we show another photograph. Here we see how floors are scrubbed 100% clean under the machinery. The mill in which this picture was taken is *one of the cleanest* in America—because its floors, the most difficult part to keep clean, are scrubbed the Finnell way, the 100% clean way.

No mill can be cleaner than its floors. How clean is yours? Can you claim the title, "*The* Cleanest Mill in America"?

Cleanliness *is* important. It helps to keep employees clean, morally and physically, to keep them happy, to improve their efficiency, to reduce accidents and to eliminate waste and soilage. The Finnell System saves thousands of dollars. One mill saves $12,000 a year.

We shall be pleased to give you complete information about the Finnell System of Power Scrubbing, its cost and its efficiency. Please address our general offices when writing.

American Scrubbing Equipment Co.

General Offices: 180 N. Wabash Ave., Chicago. Factories: Hannibal, Mo.

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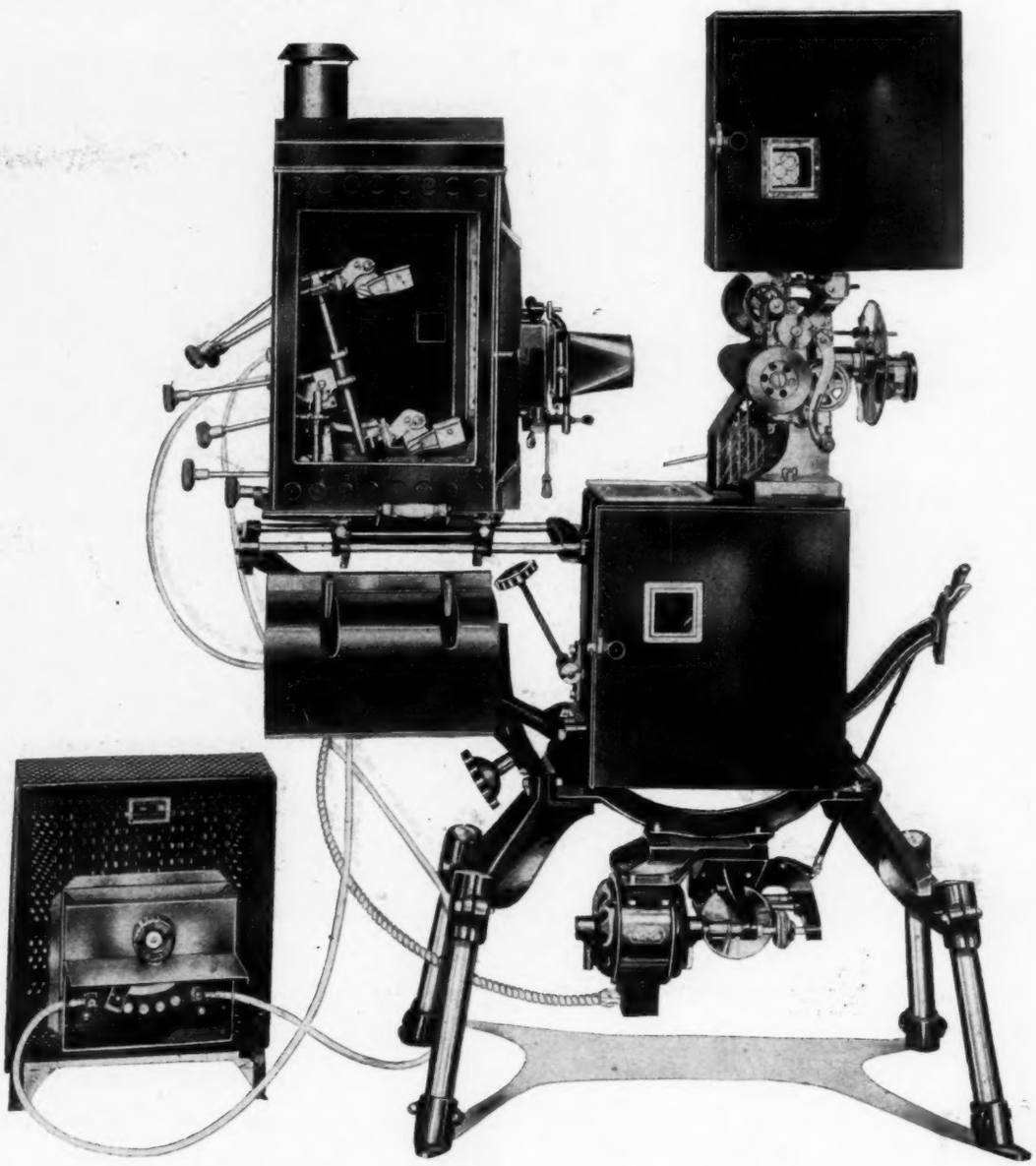


POWER'S MOTION PICTURE PROJECTOR

MEANS—

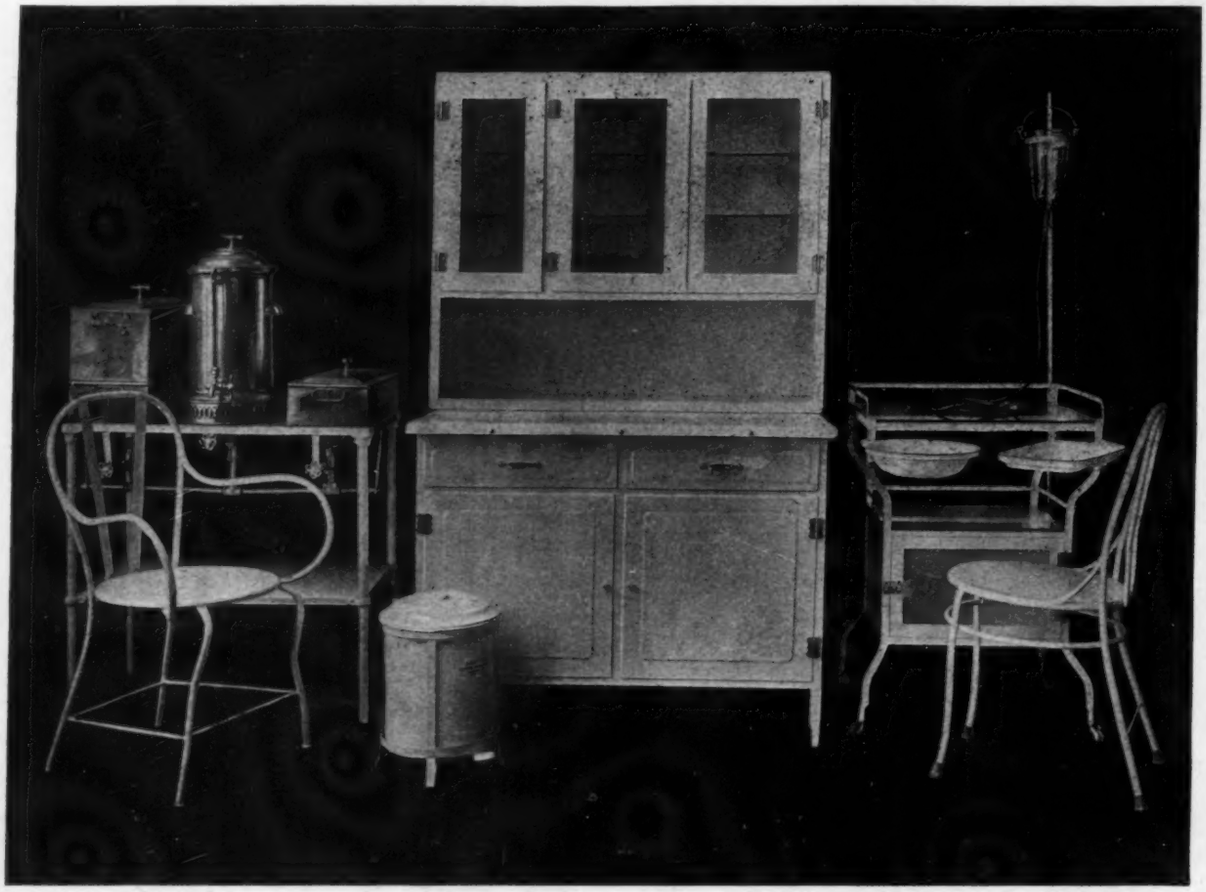
"HIGH CLASS PROJECTION
LONG SERVICE
SIMPLICITY OF OPERATION"

Complete Motion Picture Theatre Equipment

Southern Theatre Equipment Co.

Atlanta, Ga.

F. H. THOMAS COMPANY, BOSTON, MASS.



A First Aid Room or an Emergency Hospital for your employees will:

Decrease your liability for industrial accidents.

Decrease time lost through temporary incapacity of your workers.

Decrease needless suffering from minor injuries and prevent minor injuries from developing into serious cases.

Increase morale and loyalty among your employees and give you opportunity to show your interest in the welfare of your workers.

The F. H. Thomas Company has equipped First Aid Rooms for over four hundred factories and mills who have appreciated these facts.

A modern Thomas equipped emergency room will put you also among the progressive owners who are saving money and advancing the conditions of their workers.

Write for information and advice stating, if possible, the number and nature of your accidents.

A new catalogue will be ready the middle of October.

F. H. THOMAS COMPANY

689-691 Boylston St. BOSTON, MASS.

ELECTRIC INDUSTRIAL TRUCKS

INDUSTRIAL TRUCK CO. I-T-C HOLYOKE, MASS.

for the Large Cotton Mills

THIS is the *economical answer* to the problem of long and heavy hauls, over factory and warehouse floors, along loading platforms and docks, where there is irregular routing and constantly shifting conditions.

The I-T-C Storage Battery Trucks *dispense with fixed tracks* and trolleys. Swiftly, noiselessly, under perfect control, they glide in and out and around, negotiating with ease the heaviest requirements.

In I-T-C Trucks are embodied all the newest and best ideas of battery truck construction. Investigate the I-T-C *before you invest.*

ASK FOR I-T-C BULLETINS
THEY DESCRIBE VARIOUS TYPES

INDUSTRIAL TRUCK COMPANY

Div. of COWAN TRUCK CO., 107 CANAL ST.
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OUR SOUTHERN REPRESENTATIVES ARE:

The Lovingood Co., 406 Peters Bldg., Atlanta, Ga.

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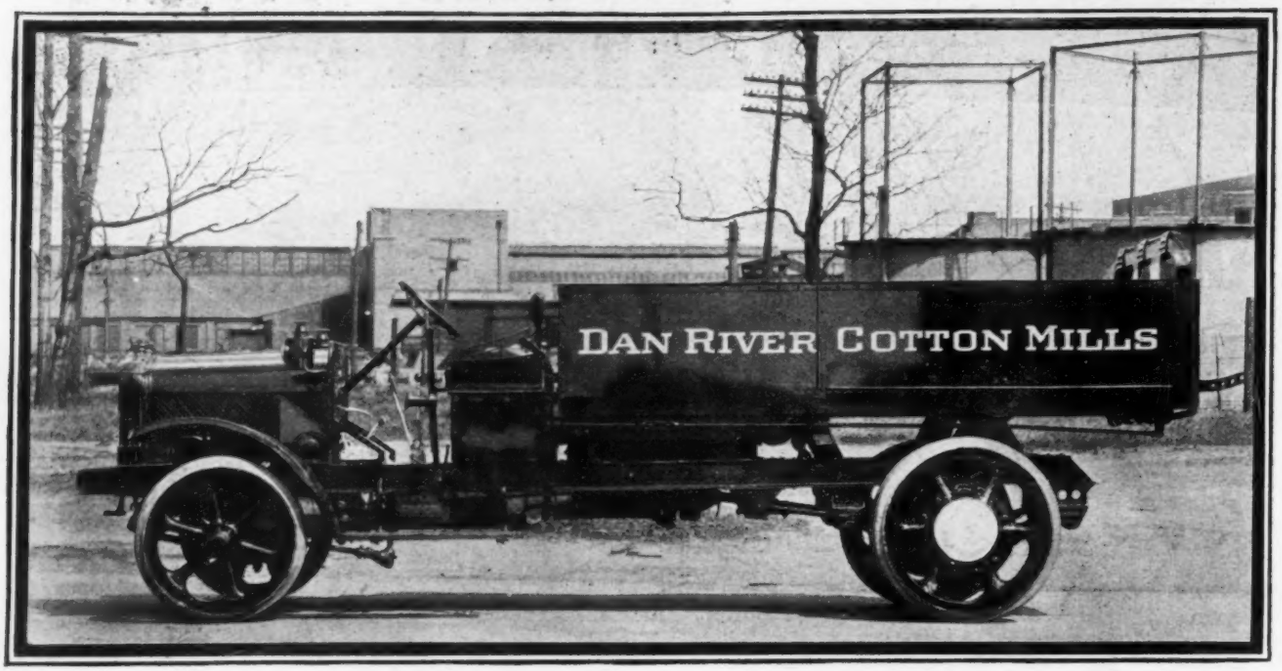
3 TYPES: TRACTORS, ELEVATING and LOAD CARRYING

White Trucks



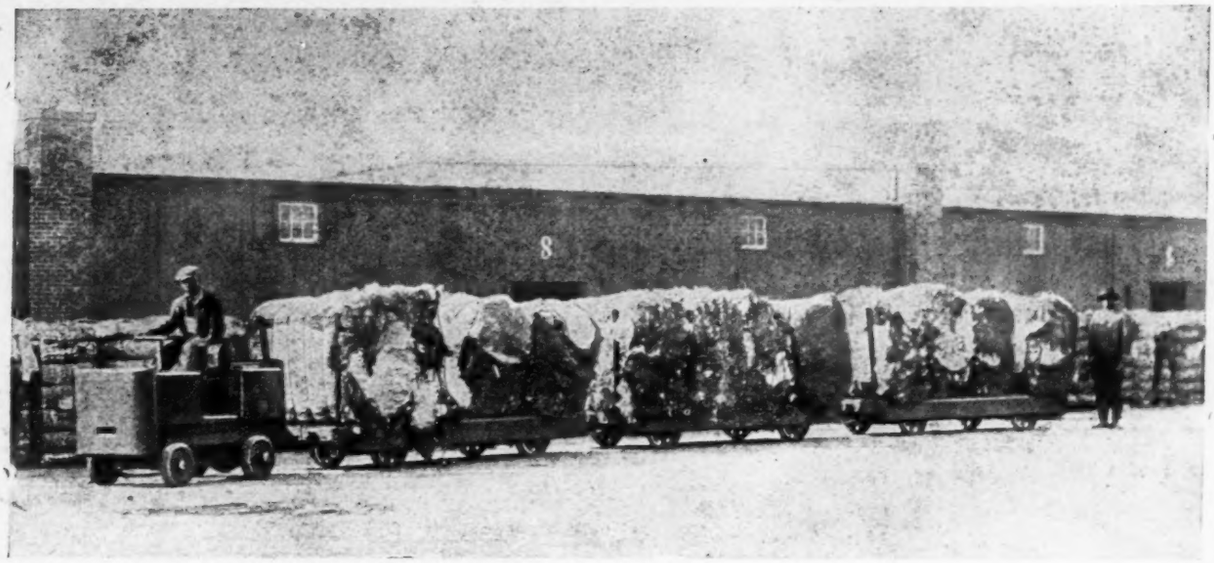
WHITE Truck *performance* is so widely and favorably known, it is considered standard among truck users. It is the basis for judging truck operation and maintenance.

There is never any argument about White dependability or economy or value. These are established factors.

Everywhere White Trucks are known for their high earning power, for their ability to do *the most work for the least money.*

THE WHITE COMPANY

CLEVELAND



In the Land of Cotton More Efficient Hauling Methods.

This is the great age of industrial efficiency.

Everywhere—more efficient methods of production are being installed.

Electricity leads, and one of the greatest improvements has been the replacement of the hand trucker by this great power.

Today it is the storage battery Truck and Tractor that is supreme in rapid transportation of raw materials, at Warehouses, Railroad Terminals and Steamship Piers.

They are great time and labor savers and are proving wise investments in the Cotton Industry.

The Storage Battery is the HEART of the machine. On its performance depends the success of your haulage system.

EDISON STORAGE BATTERIES, with their all **steel** and **iron** construction guarantee your Trucks and Tractors sure, dependable service, day in and day out.

Our Bulletin 600-C-D shows what Industrial Trucks and Tractors equipped with Edison Storage Batteries have accomplished in many industries. May we send you a copy?

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Factory and Main Office: Orange, N. J.

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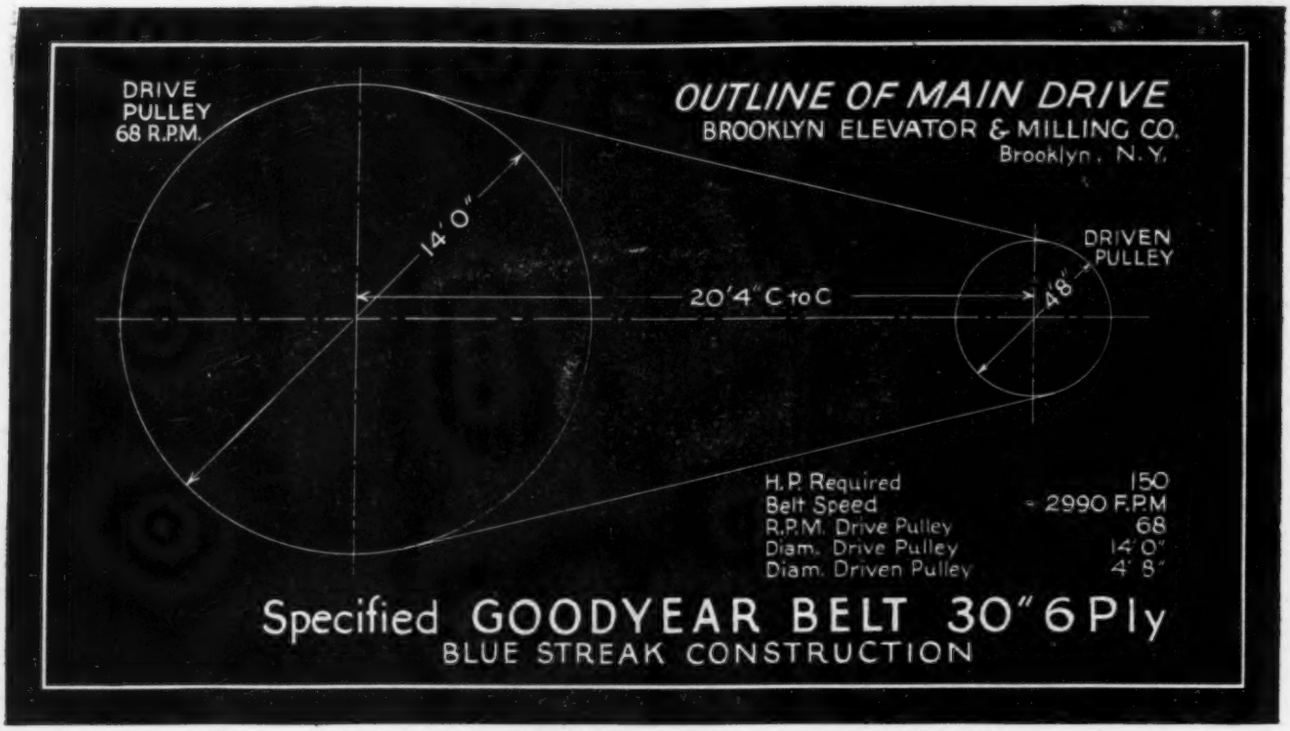


A Main Drive, an Idler, $3.28—and the G. T. M.

There used to be an idler on the main drive of the Brooklyn Elevator and Milling Company. There used to be expensive belts on the drive costing $6.84 a foot. They used to last about 18 months. For more than two years that drive has been belted at a cost of $3.28 less per foot than they used to pay—the idler has been taken off—and they have saved $389.28 in 24 months on that one drive. It happened this way:

One day in 1916 a G. T. M.—Goodyear Technical Man—called and explained the Goodyear Plan of selling belts to meet conditions. He explained the plan in detail, pointing out that a belt was really a machine part and should be bought just like any other part, to fit the conditions—and not as one buys nails. He told them how the Goodyear Technical Man carefully studied a drive before specifying a belt for it, and enumerated some of the savings that had been made on the drives of a number of plants.

They asked him to study the main drive, because the expensive belt on it was just about giving out. He did so. He found that the idler on it could be dispensed with provided a certain kind of Goodyear friction-surface belt were used. He also found that the slow speed and other conditions could be met better by a certain kind of 6-ply Goodyear construction than by the belt then in use.

He specified a certain 30", 6-ply Goodyear. It cost $229.60 less than the belt they had been using. They decided to try it. It came, was applied, and has already given 24 months of trouble-free service—and still looks as good as new. With the old kind of belt that drive used to cost $26.60 per month plus trouble and repairs. With the G. T. M.'s belt it has cost less than $10.38 per month—and no trouble or repairs. For the 24 months the saving has been $389.28.

Since then the G. T. M.—Our Mr. Kernohan—has been asked to study many other drives in that plant. His recommendations have saved so much for the company that when they built a new plant every drive in it was belted according to his analysis and specifications.

If you have a belt-devouring drive—no matter how small or how large—ask a G. T. M. to call. He'll do it without charge when next he is in your vicinity. The G. T. M.'s services are free because the savings they effect for belt users are so considerable that a gratifying volume of business is certain to come to us within a few years from the plants served.

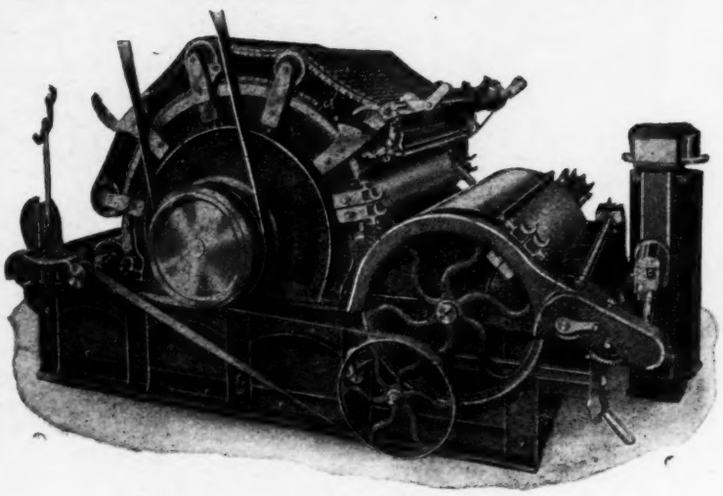
GOODYEAR TIRE & RUBBER COMPANY
Offices Throughout the World

BELTING · PACKING · HOSE · VALVES

GOODYEAR

MADE IN U.S.A.

In Comb Boxes---One Filling of



TRADE MARK REGISTERED IN NON-FLUID OIL UNITED STATES PATENT OFFICE

Lubricates

6 to 8 Weeks

TRADE MARK REGISTERED IN NON-FLUID OIL UNITED STATES PATENT OFFICE

Special Textile Lubricants

It is an absolute fact that one filling of NON-FLUID OIL in Comb Boxes will yield 6 to 8 weeks of perfect lubrication, while the best grades of oil last about a week.

Here is a splendid place to try out NON-FLUID OIL and find out for yourself how much better lubrication it gives and how much work it saves.

NON-FLUID OIL will greatly reduce the cost of lubrication, in the card room—gives better lubrication—helping to maintain the accuracy of setting and drive conditions that determine the strength of the stock. Where NON-FLUID OIL is used the bearings of carding machinery will not wear out of alignment as when oil is used.

Then, too, NON-FLUID OIL positively will not spatter on card clothing and goods being manufactured, drawing cans or floors—insuring a better product and a cleaner room.

NON-FLUID OIL should be used in licker-in bearings to prevent them from heating—on cams to minimize wear—and on cylinder bearings to avoid frictional heat, as well as in comb boxes.

Send for free testing samples and new edition of Lubrication of Textile Machinery

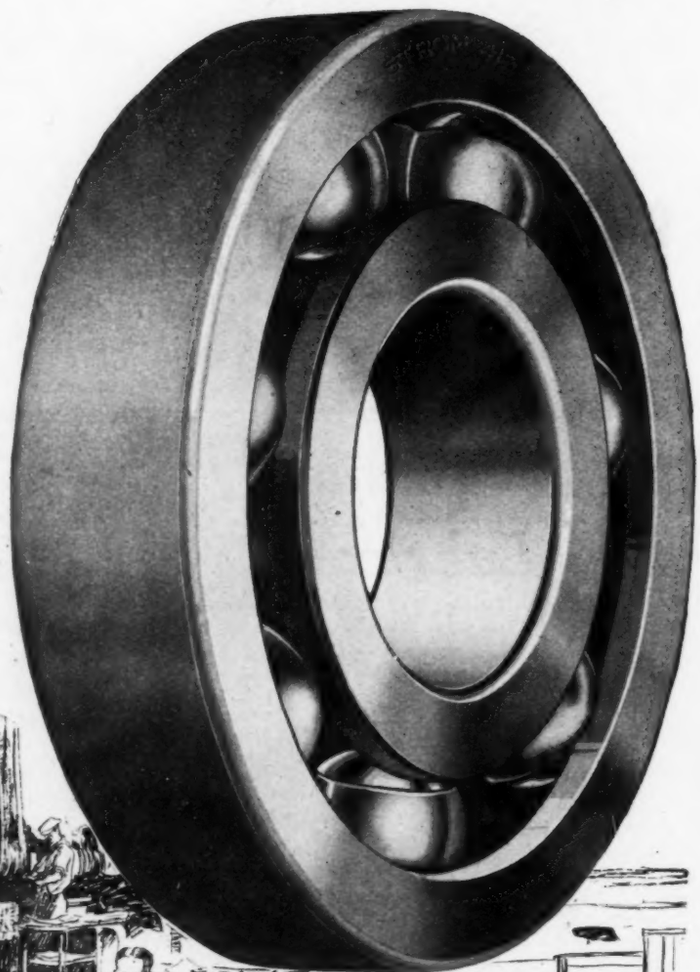
New York and New Jersey Lubricant Co.

165 Broadway, New York

Branches: Atlanta, Ga.; Charlotte, N. C. **Lewis W. Thomason, District Mgr., Charlotte, N. C.**

Strom BEARINGS

THE fact that there has been from the first a steady growth in the nation-wide demand for Strom Bearings is the best proof of the high quality of these bearings and the dependability of their performance in service wherever a shaft turns. This, perhaps, accounts for the unprecedented demand which is now being made upon us for Strom equipment.



U.S. Ball Bearing Mfg. Co.

(Conrad Patent License)

Palmer Street and Kolmar Avenue, Chicago, Illinois

35

(23)

Ladew

"The Finest Belt Made"

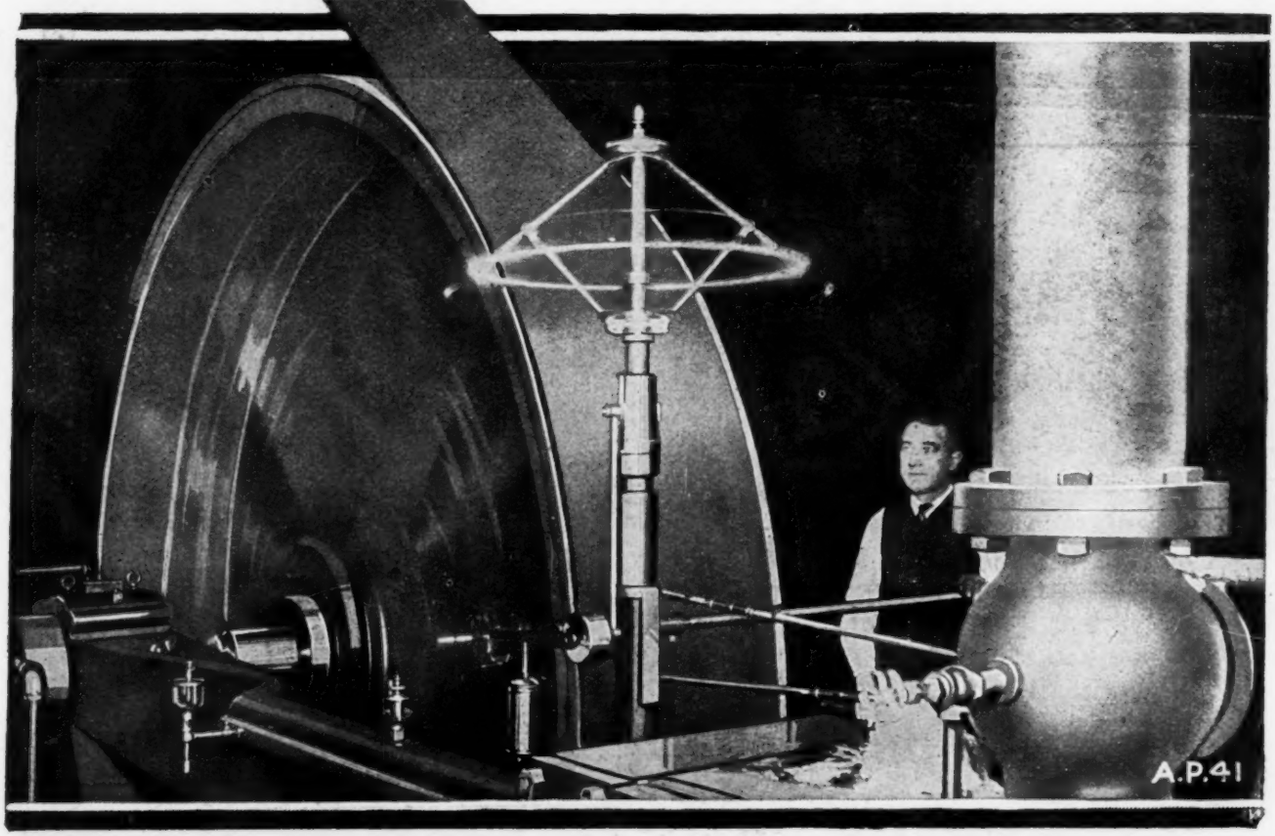
That's what the engineer in charge says of the Ladew Leather Belt here pictured. It has been running about 5 years, and took the place of another Ladew Belt of the same size **that gave 36 years of service.**

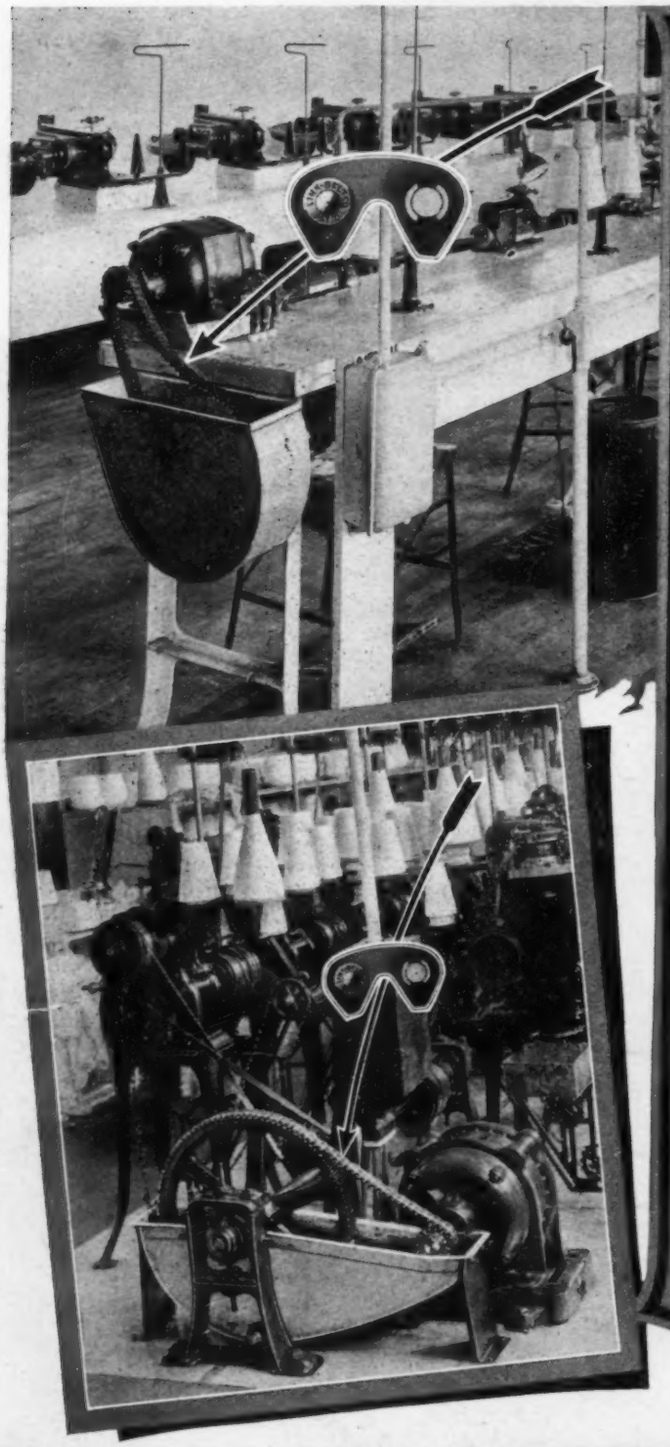
When you think of records like this, doesn't the first cost of a belt seem like a mighty secondary matter? Doesn't it appear self-evident that a belt that will give service like this, is worth almost any price you might have to pay for it?

Trouble is, most belts are mere temporary affairs—they don't last—you've got to think about replacements. Ladew Leather Belts—rightly selected, installed and cared for—**are permanent investments.**

EDW. R. LADEW CO., INC.
GLEN COVE, NEW YORK, U.S.A.

Branches and Distributors in All Principal Cities of the World Carry Complete Stocks. Look in your 'Phone Book for Local Address.





Another Indorsement for Silent Chain Drives

MR. J. E. Sirrine, one of America's foremost textile mill designers and production engineers, as a result of his research work, declares in a recent address:—

"In no case have we ever known a mill that failed to get increased production, where individual drives were installed. In applying individual motors to looms, we find we are not only getting a higher production but a better cloth, due to the fact that the speed is constant, and the cloth looses that wavy appearance, due to unequal beat-up of the filling threads. Altogether, we are thoroughly convinced that one of the ways of increasing production, is securing uniform speed, either with Silent Chains, direct connected motors, or by gears. I think **we get better results with silent chain than with any other form of drive".**

Think over these statements and send for one of our experienced engineers to study your conditions, and explain the results of various tests which have proved the superiority of Link-Belt Silent Chain. It is the ultimate drive for textile machinery.

LINK-BELT COMPANY

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- ☐ Elevators and Conveyors
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SILENT CHAIN DRIVES

COCHECO
BELTING
Known as "Old Reliable" Since 1842
Don't keep on wasting money at the coal pile, in machine output and labor cost by using cheap leather belting. Give "old reliable" Cocheco Belting a chance to save you money.
Cocheco Belting—tanned by the slow-but-sure white oak bark process, curried, stretched, stripped, properly matched and inspected all along the line—can be depended on to give maximum production at minimum power cost.
Cocheco Belting is Quality Belting—sold on merit. Ask for more information.
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Threats and Suit Do Not Worry This Satisfied Refinite User

HARVEY LAUNDRY COMPANY

82 TO 90 CHENANGO STREET

BUFFALO, N. Y.

To Users and Prospective Purchasers of

Refinite Water Softeners

As most of you doubtless know, suit alleging infringement recently was filed against us because of our use of a Refinite Water Softener.

Why this suit was brought against us is a question we are not in position to answer. We do know, however, that such action was publicly threatened before we purchased a Refinite system.

We have had our Refinite water Softener about two years. When suit was finally started against us, naturally we wondered whether we had made a mistake --- in other words, would it not have been better for us to have been intimidated into deciding against the use of a Refinite system?

We wish to state that we believe we acted wisely and that under the same circumstances we would again purchase a Refinite system. Here are our reasons:

First -- The Refinite Company has taken entire charge of the defense, as it agreed to do in the event of such action. The suit has not cost us one minute of annoyance nor one cent of expense. We have the manufacturer's guarantee of protection against possible damages (we can have a surety bond, in addition, if we want it).

Second -- The water supplied our laundry is 7 1/2 grs. hardness. With this water we used 30 lbs. of soap and 70 lbs.of soda to wash $100 worth of work. Since installing Refinite, we use but 13 lbs. of soap and 12 lbs. of soda for every $100 worth of work --- a saving of 56 2/3 per cent on soap and 82 6/7 per cent on soda!

Refinite soft water prevents scale in our steam boilers and pipes. This has greatly reduced our fuel consumption, in addition to saving much trouble, time and cost of repairs and equipment.

Refinite gives us a perfectly neutral water of NO HARDNESS. This water not only cuts our washroom expense far more than half but enables us to launder the finest fabrics that are washable without injury to color or fibre.

Instead of regretting our action, we are of the opinion that we could not afford to be without a Refinite Water Softener even if we did not have the unlimited co-operation and protection of the Refinite Company.

HARVEY LAUNDRY COMPANY
By John E. Wesley
President.

REFINITE
Nature's Water Softener

The above tells you first hand what Refinite means to this user—why he could not afford to be intimidated.

The Refinite Water Softener is making money for this user—it will make money for you.

The Refinite Company is protecting this patron—it will protect you.

LET US TELL YOU ABOUT REFINITE.

THE REFINITE CO., Refinite Building, OMAHA, NEB.

New York Chicago Cincinnati Minneapolis Kansas City Atlanta Pueblo Salt Lake City San Francisco Los Angeles Detroit Toronto Spokane Buffalo

Industrial Communities

At this time when so much thought is directed to the betterment of living conditions, we offer the coordinated services of a thoroughly equipped organization, together with an extensive experience.

Community Buildings
Model Houses
Water Supply
Sewerage
Dairies
Electric Lighting
Sidewalks
Community Laundries
Street Improvements
Refrigerating Plants

SERVICE

J · E · SIRRINE

ENGINEER

GREENVILLE · SOUTH · CAROLINA

COMPLETE BUILDINGS READY FOR SHIPMENT

No Excavating Necessary

"Circle A" Buildings are put up as easily in winter as in summer. They are factory built complete in interchangeable units: Floors, walls, ceilings and roof sections. When they reach you there is no painting to be done, no hardware to be attached; they are all ready to the last detail for instant assembling by bolting. Here then is the immediate solution of your industrial-housing problem; and besides "Circle A" structures are more durable and cost less than those which are standard built.

"Circle A" Units assure both permanency and portability. Their salvage value is 100%, for they are dismantled just as easily as they are erected, and without any damage. The same units may be used interchangeably for factories, schools, residences, bunk houses, recreation halls, storage buildings, barracks, offices, hospitals, etc.

The co-operation of the "Circle A" Service Department is at your immediate command. We maintain a permanent organization of engineers, architects and building superintendents for the purpose of extending our clientele active assistance at all times. No matter how big your building problem may be do not hesitate to ask our advice.

If you so desire, one of our industrial-housing experts will call at your office to present the "Circle A" story in full detail.

For further information write or wire our nearest office—Chicago, Monroe Bldg.; New York, Postal Telegraph Bldg.; Fort Worth; Detroit, Hall Bldg.

THE ALEXANDER LUMBER COMPANY

"CIRCLE-A"

PATENTS PENDING

INTERCHANGEABLE UNIT BUILDINGS

Industrial Housing

QUICK SHIPMENT

A Train Load of ALADDIN Houses Per Day

Depending upon size of house, we load from one to three complete houses in each car. Normally, shipments arrive at Atlantic Coast points in about six days after leaving our mill.

QUICK RESULT

A Gang of 120 Men Can Erect 10 ALADDIN 5-Room Houses Per Day

Aladdin Houses are Readi-Cut. Every piece of material, joists, studs, rafters, sheathing, siding, flooring, interior finish, is cut to proper size, marked and numbered and ready to nail in place.

SERVICE PLUS

Immediate Action on Any City Project—or Any Housing Problem

Our plans are drawn, prepared and finished for cities of from 300 to 3,000 poulation. Experienced town planners, landscape achitects, engineers and builders have spent months of study and work in their production. This service becomes a part of every Aladdin Housing transaction—a single house or a complete city.

Over One Thousand ALADDIN Houses Carried in Stock

All lumber, shingles, lath, millwork, siding, flooring, interior finish, plaster, hardware, paints, nails, are carried constantly in stock, ready for instant shipment.

Hundreds of American Corporations Have Built ALADDIN Houses

As many as five hundred Aladdin houses have been sold to a single corporation. Re-orders are constantly received from corporations who have tested our houses by actual purchase and erection.

A Single House—or A Complete City

The Aladdin Company will quote you a definite price on a single house or complete cities of 300, 500, 600, 1,000, 1,500 and 3,000 population. These cities are now listed in our book on Industrial Houses. Cities include homes, stores, churches, schools municipal buildings, water distributing systems, electric light plants and distribution, sewerage systems, trees, etc. "Book of Aladdin Homes" No. 620 with full information, floor plans and prices will be mailed on request. Aladdin Book "Industrial Housing" mailed only to inquiries written on business or official stationery.

Complete Cities

-or a Single House

The Aladdin Co.

621 SOVEREIGN AVE., HOME BUILDERS TO THE NATION TOWNBUILDERS TO THE NATION HATTIESBURG, MISS.

Cozy-Attractive-Economical Homes

for Industrial Villages

Manufactured in large quantities, after patented methods. Especially adapted to industrial villages. Used by many of the largest corporations.

Thoroughly substantial. Costs less than half the ordinary house. Quickly erected. Absolutely guaranteed.

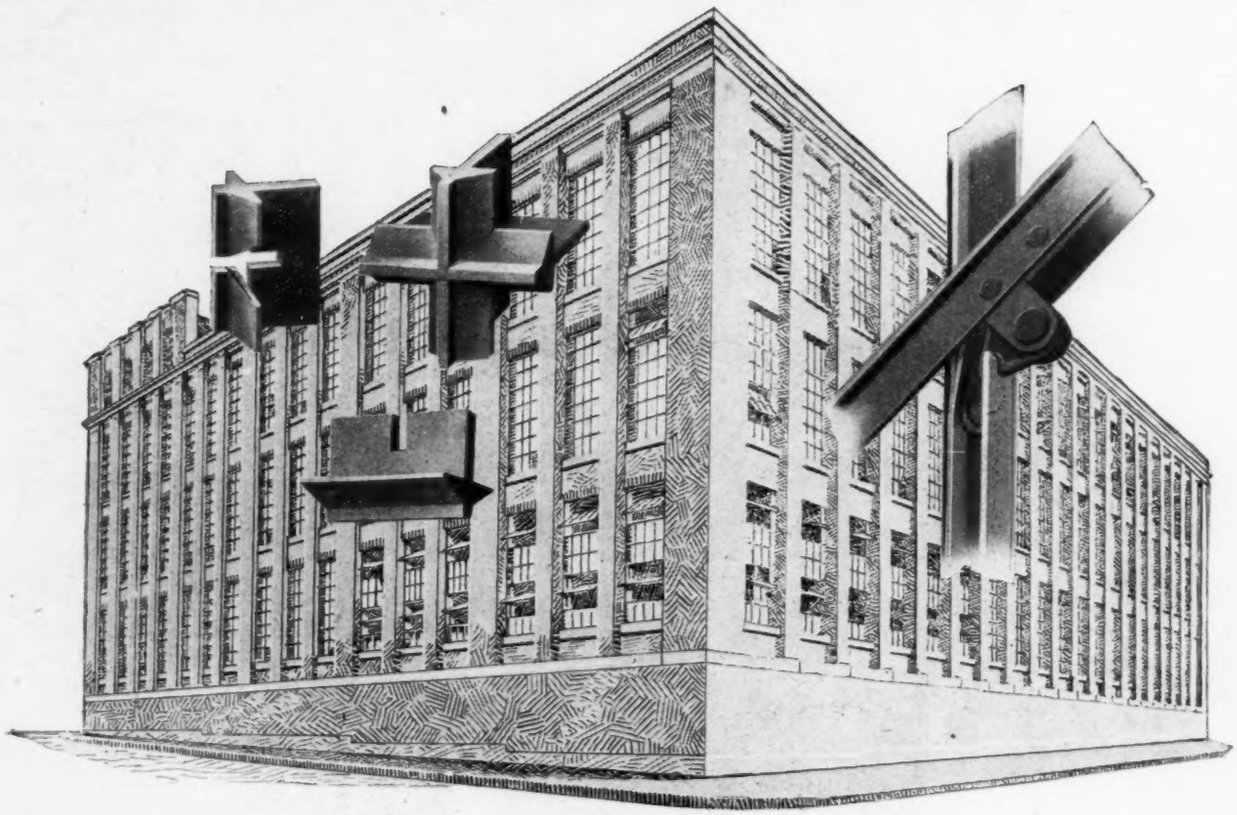
Saves architect's, contractor's, lumber dealer's and jobber's superfluous profits. Cost of manufacture and erection cut in half.

It Will Pay you to Investigate.

Address

QUICKBILT Bungalow Department F118

A. C. Tuxbury Lumber Co., Charleston, S. C.



Clean Lines

You will know Lupton Factory Sash by its clean-cut lines.

A joint that does not mar the finished appearance of the sash. Pivots that preserve the weathering, yet avoid clumsiness.

The Lupton Joint has been a feature of Lupton Factory Sash for many years. It secures ample strength by the manner or framing the muntins together; the stronger the wind pressure, the tighter is the lock of the intersecting members.

With the recently-revised Lupton sections, the lines of the muntins and frame members are neater and cleaner than ever before.

Full particulars about details and sizes in Catalogue 10-LSS. Are you posted on the new Standard and Warehouse Stock sizes?

DAVID LUPTON'S SONS COMPANY

Amber St. and Allegheny Ave. **Philadelphia, Pa.**

Makers of Modern equipment for daylight and natural ventilation

Chicago
New York

Pittsburgh
Cleveland
Washington

Boston
Detroit

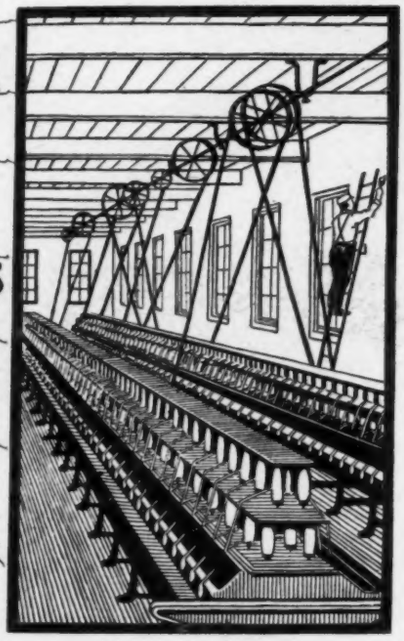
Canadian Manufacturers: ***The A. B. Ormsby Co., Ltd., Toronto***

Lupton
Lupton Steel Sash
Pivoted Factory Type
Counterbalanced Type
Pond Continuous Sash
for sawtooths, monitors and side walls
Pond Operating Device
for long lines of sash
Lupton Rolled Steel Skylight
"INVESTMENT VALUE"

Sketch shows the Reading Cotton Mill, Joseph Bancroft & Sons Co., Reading, Penna. Lupton Factory Sash used.

Lupton
INVESTMENT VALUE

Give the Sun a chance



No matter how brilliant the rays of the *SUN*, unless they are evenly diffused and well reflected you do not get the maximum of Light.

You want-more light-good light-daylight-

this is in your easy reach by using-

Pee Gee FACTRILITE
LIQUID DAYLIGHT

For Interior Walls and Ceilings

Supplies more and better light, by reflecting and diffusing Sunlight as well as artificial light to every corner of your mill thereby *increasing the hours of daylight and saving much of the artificial light* required at night. Pee Gee Factrilite has a high gloss, tile-like finish of highest reflective power—

Stays White for Years

Pee Gee Factrilite is made by our own perfected process of especially prepared white pigments and long oil, therefore it will not turn yellow like ordinary paints which contain lead and varnish.

It is an economical paint, because it is *Washable, Durable, Germ and Moisture Proof.* Saves the expense of frequent repainting, does not peel or crack and withstands the vibration of heavy machinery

Pee Gee Factrilite spreads freely and is easily applied on wood, plaster, stone, brick or metal surfaces, having a covering capacity of 450 to 550 square feet per gallon. It is made in gloss enamel or eggshell finish.

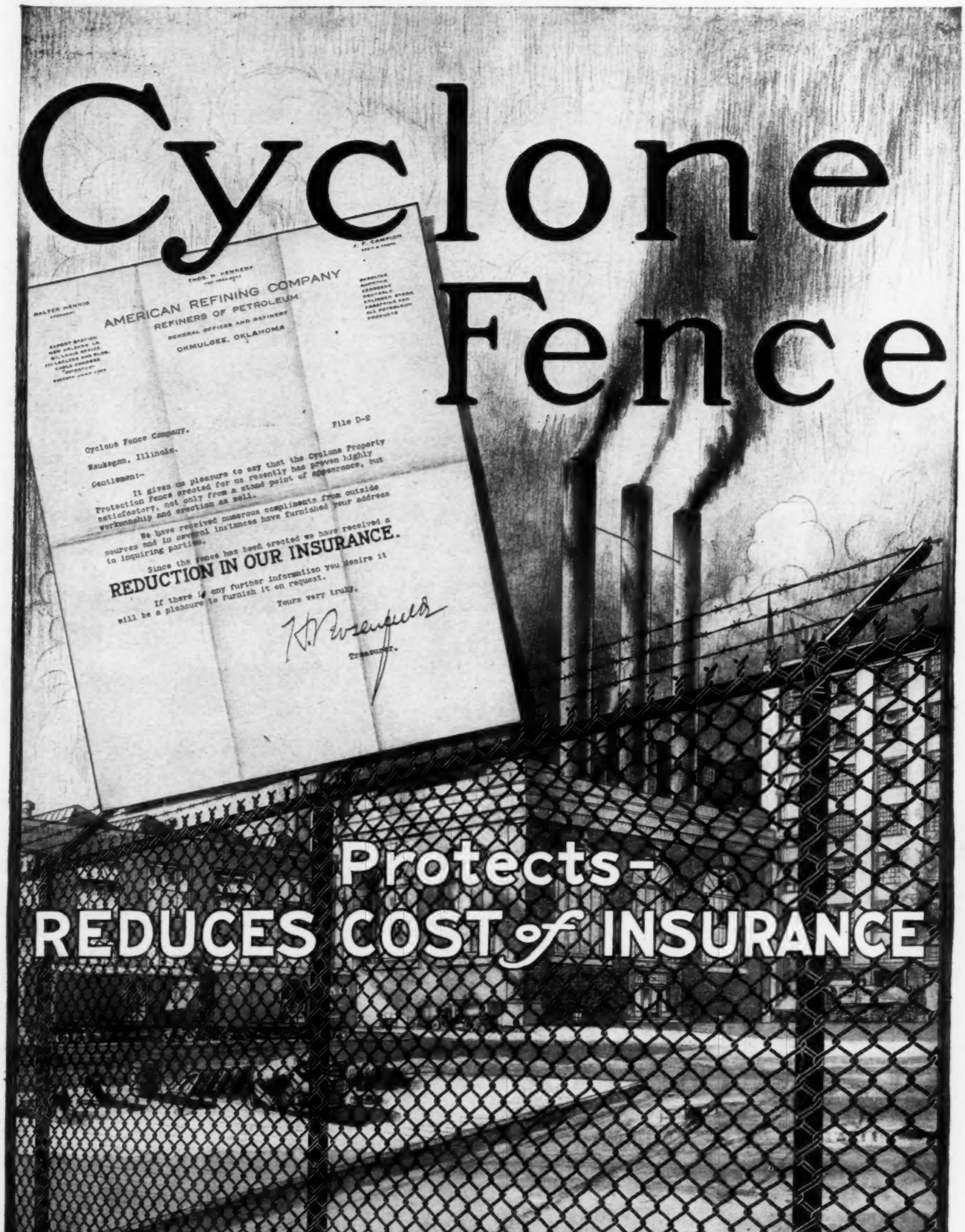
We Supervise the Job at Our Expense

Write today for Sample Board painted with Pee Gee Factrilite and Booklet on Pee Gee Industrial Paints

Peaslee-Gaulbert Company

Incorporated

Established 1867 **Paint Grinders, Varnish Makers** **Louisville, Ky.**


Cyclone Fence
AMERICAN REFINING COMPANY
REFINERS OF PETROLEUM
GENERAL OFFICES AND REFINERY
OKMULGEE, OKLAHOMA
Cyclone Fence Company,
Waukegan, Illinois.
File D-2
Gentlemen:-
It gives us pleasure to say that the Cyclone Property Protection Fence erected for us recently has proven highly satisfactory, not only from a stand point of appearance, but workmanship and erection as well.
We have received numerous compliments from outside sources and in several instances have furnished your address to inquiring parties.
Since the fence has been erected we have received a REDUCTION IN OUR INSURANCE.
If there is any further information you desire it will be a pleasure to furnish it on request.
Yours very truly,
Treasurer.
Protects-
REDUCES COST of INSURANCE

Other Cyclone Products Are

Chain Link Fabrics
Conveyor Wire Belting
Ornamental Lawn Fence
Ornamental and Farm Gates
Flower Guard and Trellis

Phone, Wire or Write Main Offices at Waukegan, Illinois, or Branch Offices Nearest You

CYCLONE FENCE COMPANY

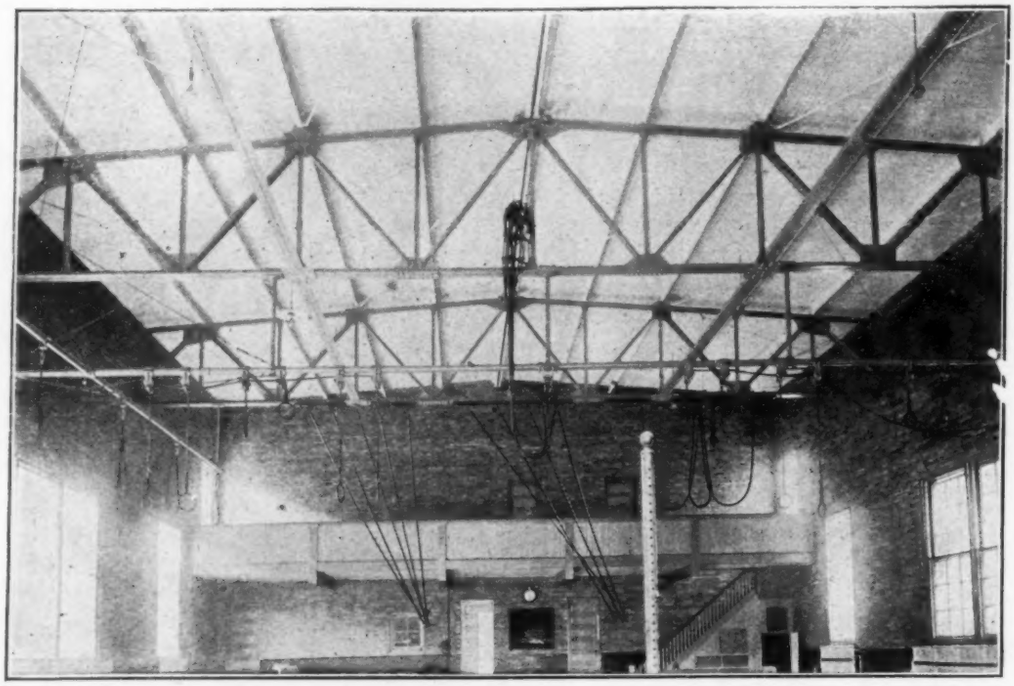
Factories: Waukegan, Illinois -:- Cleveland, Ohio

Branches: Chicago Detroit Rochester Philadelphia New York City Oakland, Calif. Fort Worth, Tex. Portland, Ore. San Francisco

LOOK FOR THE Red Top MARK OF QUALITY ON ALL CYCLONE PRODUCTS

Other Cyclone Products Are

Interior Partitions
Window and Skylight Guards
Flexible Steel Matting
Industrial Housing Fence
Wire and Iron Work of All Kinds



Vorco-lite and the Vortex Painter

A Combination Hard to Beat

When you put white oil paint on your factory interior, you want *high-grade* material and you want it put on *right*. Vorco-lite is a Vortex Quality Paint that we can go to the mat for. The Vortex Painter is a mechanical applier that handles Vorco-lite *right*.

The illustration above is that of the East 55th Street Gymnasium, Cleveland, Ohio. Each panel in this ceiling contains 104 square feet. It took two hand-brush men 35 minutes to go over one of these panels with *one coat* only. One machine-man with the Vortex Painter covered one of these panels with one application of Vorco-lite equivalent to *three* coats in 5 minutes.

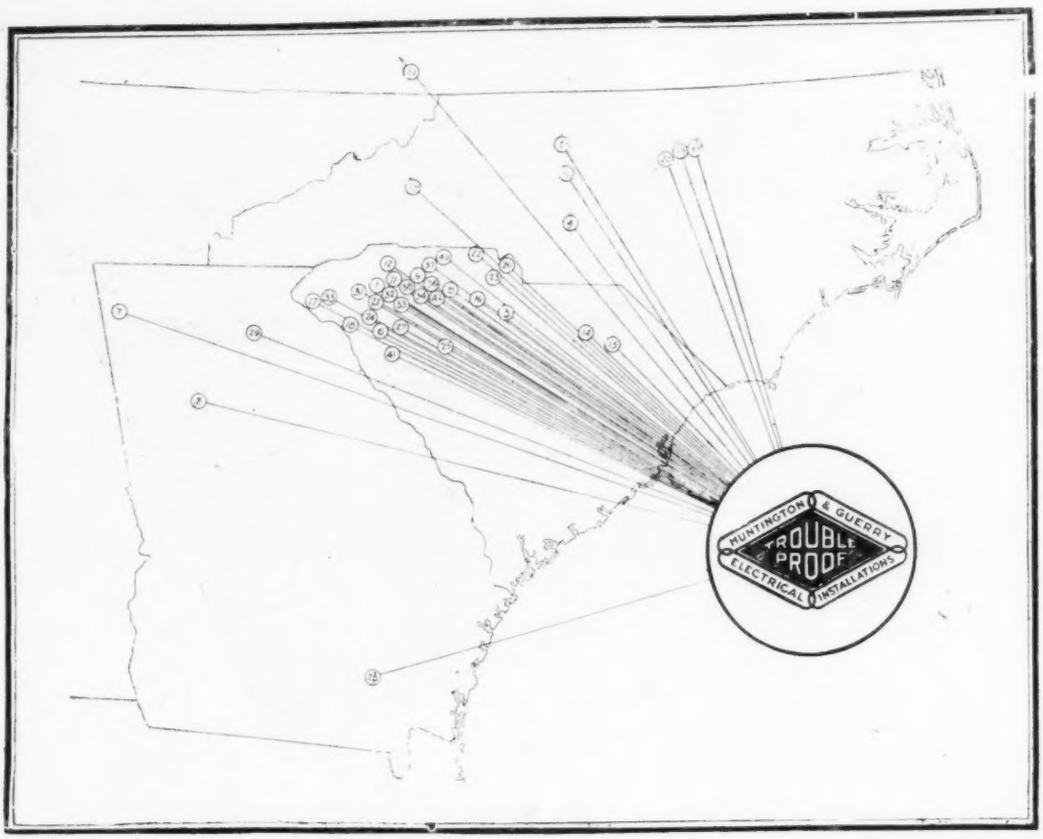
Figure it out for yourself.

There is a reliable painting contractor in your locality who will be glad to use the Vortex Painter on your work. Or we are prepared to send you this equipment, with full instructions for its use.

VORCO BRANDS

The VORTEX Manufacturing Co. Cleveland. Ohio.

Here Are the Owners of the Million Happy Spindles Driven and Lighted by Huntington & Guerry "Trouble-Proor" Electrical Installations.



(1) GREENVILLE, S. C.
1st Southern Textile Exposition.
2nd Southern Textile Exposition.
3rd Southern Textile Exposition.
Southern Textile Exposition Bldg.
American Spinning Co. (4 contracts).
Dunean Mills (3 contracts).
Poinsett Mills
Woodside Cotton Mills
Brandon Mills
Camperdown Mills
Monoghan Mill
Mills Mfg. Co.
City of Greenville (Pumping Station)
Camp Sevier (U. S. Nat. Guard)

(2) ATLANTA, GA.
Exposition Cotton Mills.

(3) GREAT FALLS, S. C.
Republic Cotton Mill No. 2.

(4) ALBEMARLE, N. C.
Wiscassett Mills Co. (8 contracts)
Efird Mfg. Co. (6 contracts)

(5) WINSTON-SALEM, N. C.
P. H. Hanes Knitting Co. (3 contracts)
Hanes Rubber Co. (2 contracts)
Hanes Hosiery Mills

(6) HONEA PATH, S. C.
Chiquola Mfg. Co. (2 contracts)

(7) TRION, GA.
The Trion Company

(8) UNION, S. C.
Monarch Mills (2 contracts)
Victor-Monoghan Mill (Ottary Plant)

(9) SPARTANBURG, S. C.
Beaumont Mfg. Co. (2 contracts)
Saxon Mills (2 contracts)
Caldwell & Co. (2 contracts)
Camp Wadsworth (U. S. Nat. Guard)

(10) LEXINGTON, N. C.
Erlanger Cotton Mills (3 contracts)

(11) GREER, S. C.
Victor Monoghan Mills (Greer Plant)
Victor Monoghan Mills
Mc Iohon Mfg. Co. (Victor Plant) (3 contracts)

(12) ARLINGTON, S. C.
Victor-Monoghan Mills (Apa ache Plant)

(13) MARION, N. C.
Clinchfield Mfg. Co.

(14) DARLINGTON, S. C.
Darlington Mfg. Co.

(15) HARTSVILLE, S. C.
Southern Novelty Co. (2 contracts)

(16) CHESTER, S. C.
Baldwin Cotton Mills (4 contracts)
Sprigstein Mills (2 contracts)
Eureka Mills

(17) WESTMINSTER, S. C.
Oconee Mills (2 contracts)

(18) ANDERSON, S. C.
Riverside Cotton Mills (2 contracts)
Orr Mill
Equinox Mill (2 contracts)
Anderson Cotton Mills

(19) DURHAM, N. C.
Golden Belt Mfg. Co. (2 contracts)
Erwin Cotton Mills Co.
Durham Hosiery Mills Co. (4 contracts)

(20) CHAPEL HILL, N. C.
Durham Hosiery Mills
University of N. C.

(21) PIEDMONT, S. C.
Piedmont Mfg. Co. (2 contracts)

(22) CLOVER, S. C.
Hawthorn Spinning Mills

(23) ROCK HILL, S. C.
Aragon Mills
Arcade Cotton Mills

(24) BELTON, S. C.
Blair Mills

(25) NEWBERRY, S. C.
Mollohon Mfg. Co. (2 contracts)

(26) FORT MILL, S. C.
Fort Mill Mfg. Co. (5 contracts)

(27) WARE SHOALS, S. C.
Ware Shoals Mfg. Co.

(28) WAYCROSS, GA.
Ware County Light & Power, Co.

(29) GAINESVILLE, GA.
Pacolet Mfg. Co. (3 contracts)
Gainesville Cotton Mills (3 contracts)

(30) MAYSVILLE, KY.
Maysville Cotton Mills (2 contracts)
Cochran Bros. (2 contracts)

(31) EASLEY, S. C.
Easley Cotton Mills
Alice Mills (2 contracts)

(32) SIMPSONVILLE, S. C.
City of Simpsonville
Simpsonville Cotton Mills

(33) FOUNTAIN INN, S. C.
Fountain Inn Mfg. Co.

(34) WOODRUFF, S. C.
Woodruff Cotton Mills

(35) SENECA, S. C.
Victor-Monoghan Mills (Seneca Plant)

(36) TROUGH, S. C.
Pacolet Mfg. Co. (2 contracts)

(37) GLENDALE, S. C.
D. E. Converse Co.

(38) TUCAPAU, S. C.
Tucapau Mills

(39) EAST DURHAM, N. C.
Durham Cotton Mfg. Co. (2 contracts)

(40) GAFFNEY, S. C.
Gaffney Mfg. Co.

(41) GREENWOOD, S. C.
Grendel Mills

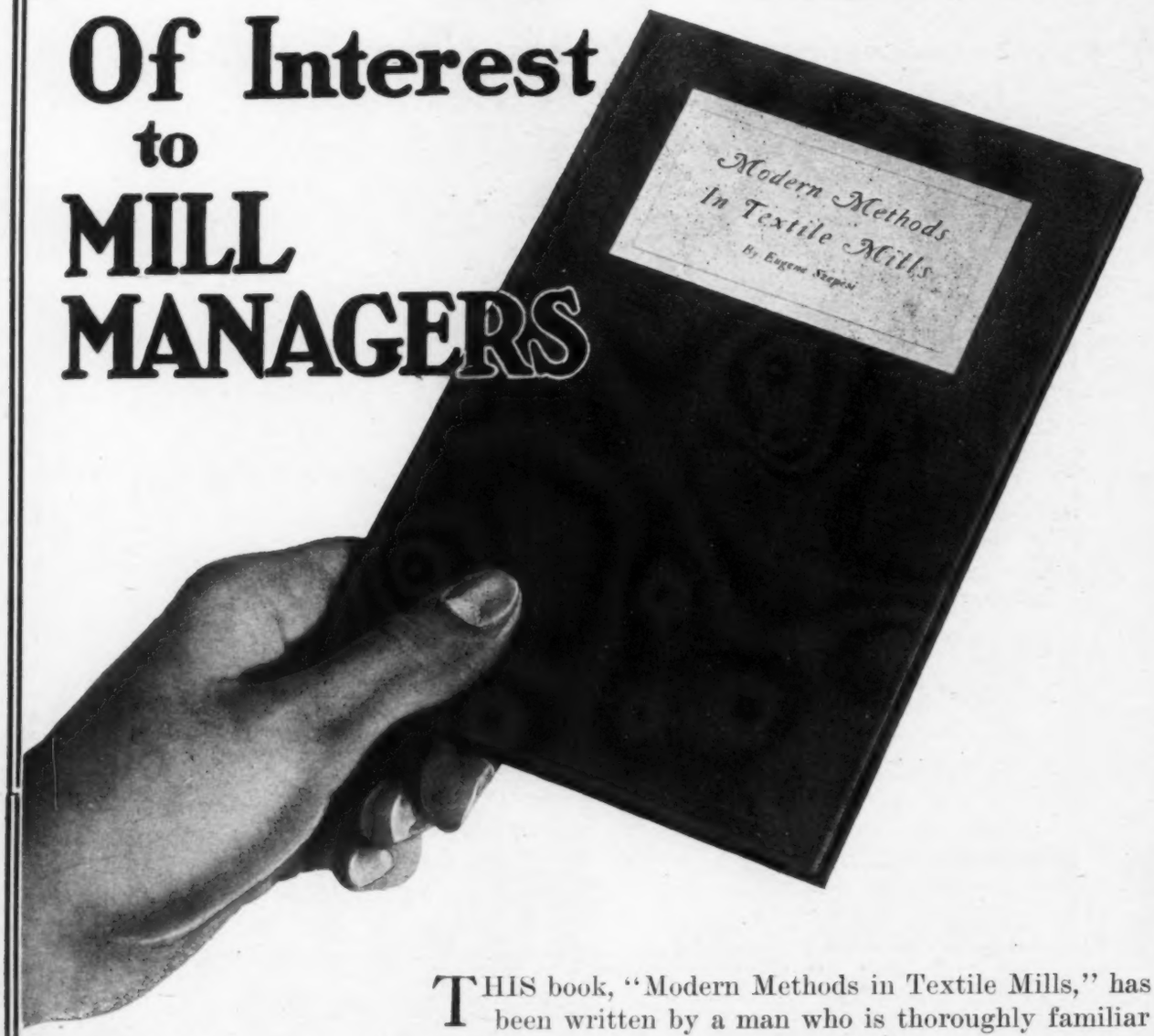
(42) JONESVILLE, S. C.
Victor-Monoghan Mills (Wallace Plant)

(43) ENOREE, S. C.
Enoree Mfg. Co.

HUNTINGTON & GUERRY, Inc.

Greenville, South Carolina

Of Interest to MILL MANAGERS



THIS book, "Modern Methods in Textile Mills," has been written by a man who is thoroughly familiar with the problems of textile manufacturing. It contains, therefore, much that is of interest and value to mill executives, particularly those who are responsible for production.

If you have not read this book, send for a copy. It is free to executives. You are sure to get one or two ideas from it that will more than repay you for the time taken to read it.

Write for your copy today.

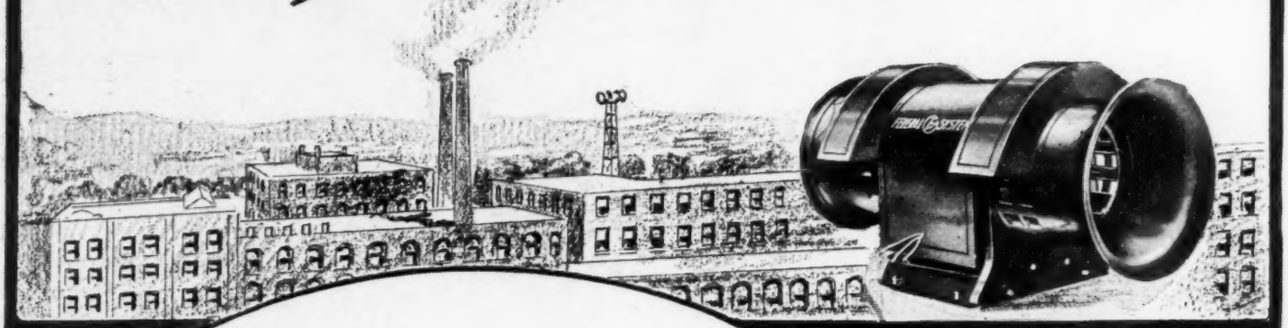
GUARANTEED BY THE NAME

Westinghouse Lamp Company

165 Broadway, New York City

Sales Offices and Warehouses Throughout the Country.
For Canada—Canadian Westinghouse Co., Limited, Hamilton, Ontario.

Federal Electric Siren
The Super Signal for Textile Mill Use



A COMMANDING note that everyone hears above the din of looms and spindles—and instinctively obeys. That is what makes the Federal Electric Siren ideal for textile mill use.

As an outdoor time signal it is heard for miles around—a dependable call for every day, the Type B Siren is supreme.

For indoor use as fire alarm or call signal, the smaller Type A Siren fills a distinct need.

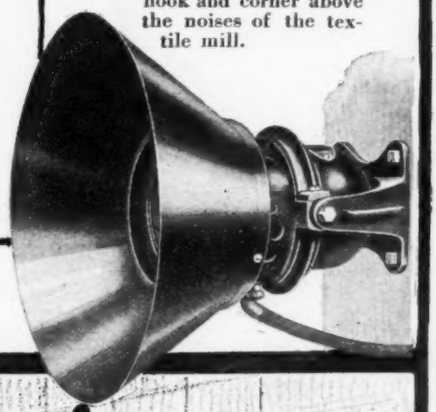
Always ready—operated from the office, engine room or any number of distant points. Current cost averages $2.00 per year. No other maintenance expense.

FEDERAL ELECTRIC COMPANY

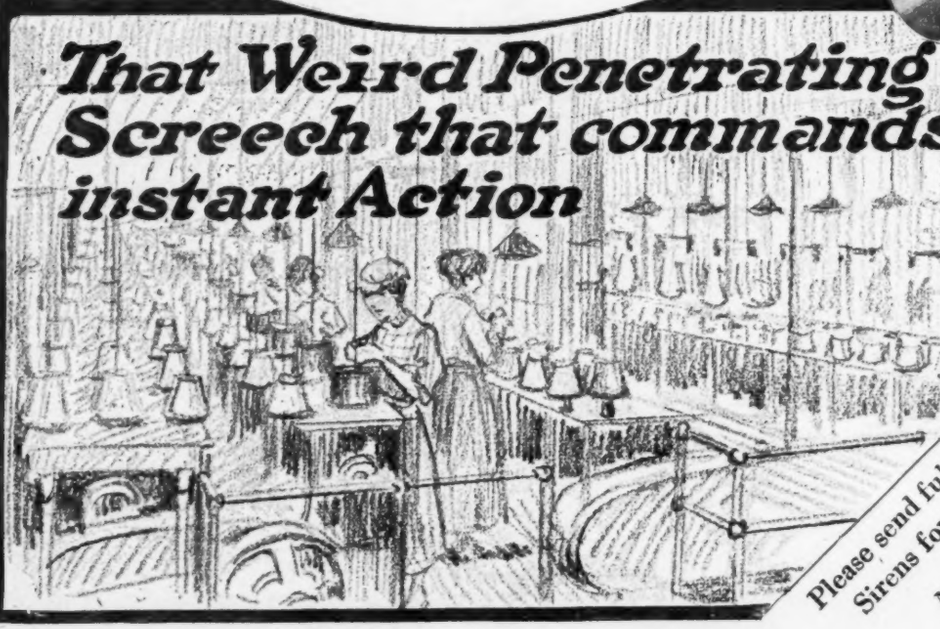
Representing Federal Sign System (Electric)
LAKE AND DESPLAINES STS., CHICAGO
91 New Montgomery Street, SAN FRANCISCO, CAL.
629-649 West 43rd Street, NEW YORK, N. Y.
Branches in all Large Cities

Type B Double Head
—for outdoor use as a starting and quitting signal or for fire and emergency calls. Penetration radius 1½ miles.

Tpye "A" Siren for interior use as a fire alarm, call systems and other uses requiring a signal to be heard in every nook and corner above the noises of the textile mill.



That Weird Penetrating Screech that commands instant Action



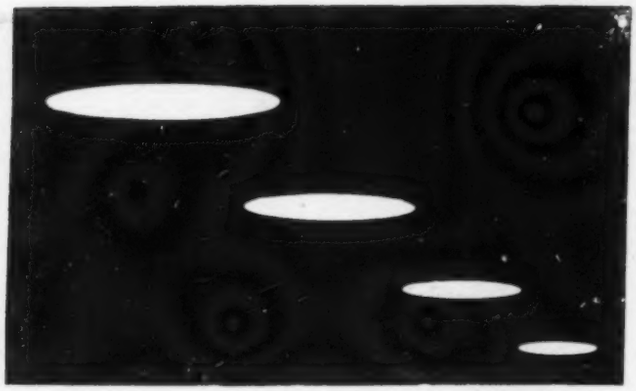
Please send full particulars about Federal Electric Sirens for _____ use.

Name _____

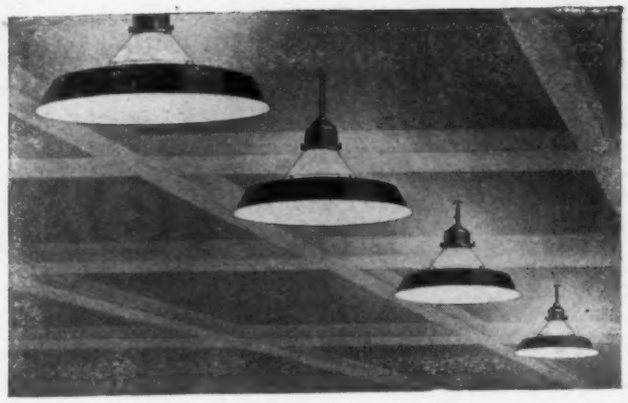
Company _____

Address _____

O-12



Even the most efficient reflector can only cut out *part* of the glare if it must be seen against the deep black background of an unlighted ceiling.



The Glass-Top IVANHOE reflector lights the ceiling just enough to avoid glaring contrast with the brilliantly lighted reflector below.

Another New "IVANHOE"
A Glass-Top Reflector

The new developments in lighting come from IVANHOE. Here is the latest—the regular bowl-type or RLM-type reflector made with a *glass top.* This permits a small portion of the light (10% or less) to go to the ceiling. By lighting the ceiling, you avoid the glaring contrast of a brilliantly lighted reflector against a black background. The illustrations above show how glare is reduced—in fact, *for the first time completely eliminated*—by this new reflector! The glass-top steel reflector is an IVANHOE idea. If you still have a glare problem, why not order at once samples of this new reflector and *give it a tryout in a bay or a building?*

IVANHOE REGENT WORKS, of General Electric Co.
Cleveland, Ohio

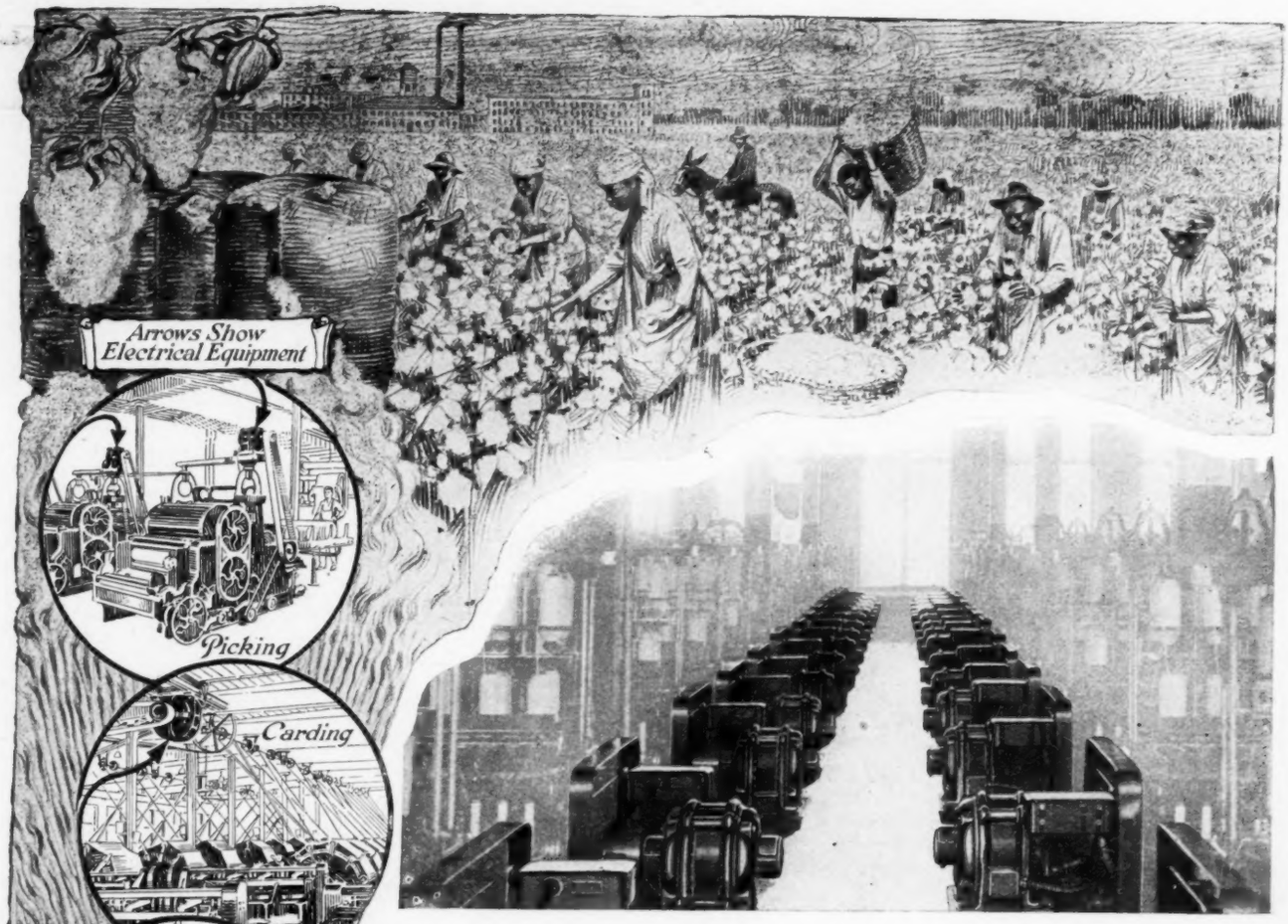
"Ivanhoe" Steel Reflectors, Lighting Glassware, Anderson Self Adjusting Arms and Illuminating Service.

Ivanhoe Glass-Top Reflectors

The contour of the reflector is the same as before—the tried and proven RLM STANDARD or bowl-type. It reflects the light efficiently into the working plane. It protects the eye from the intense brilliance of the MAZDA filaments. And now, by permitting a little upward flow of light to the ceiling, it protects the eye also from that *other kind of glare* — brilliant spots of light against the deep blackness of the ceiling! Both kinds of glare are bad. You've eliminated one—why not eliminate the other!

"Service to Lamps"

IVANHOE
SHADES-REFLECTORS



G-E Motor Driving Spinning Room, Sterling Cotton Mills, Franklington, N. C.

Electric Power for Maximum Production

Electric Power from G. E. Motors is a necessary condition where most product of highest quality is desired at least power cost in textile mills.

G-E Motors have been specially developed for the individual drive of spinning and twisting frames to permit maximum production and ideal operating conditions at maximum constant speed.

Losses and danger due to line shafting and belts are eliminated by the use of G-E individual motor drive for spinning frames. The dirt and fly, that are circulated by belts and pulleys and often spoil yarn, are likewise eliminated.

The indestructible windings for these motors; their fans which assure positive ventilation; the waste-packed bearings that require minimum attention and use least oil without leaking; the extra-heavy shafts assure continuity of operation and, therefore, permit maximum production.

Let our specialists look over your power problems and give you the benefit of their experience obtained in supplying most of the motor drives in use today.

Principal Office: Schenectady, N. Y.
Mill Power Dept. Boston, Mass.

44-5

GENERAL ELECTRIC COMPANY

Permutit
TRADE MARK
Water Rectification Systems

Write the following positive gains against the cost of installing and operating a "Permutit" Water Softener:

Big savings in soaps, and alkali

Reduced consumption of dye stuffs

Brighter, truer, more uniform colors

Perfect matching of shades
Less re-dyeing, with resultant labor saving

Spoiled goods materially reduced

Better, more uniform quality of product

Lower fuel consumption

And remember—**you pay for "Permutit" once, but its earnings continue indefinitely.**

Fact is, you cannot afford NOT to use **"Permutit."**

Shall one of our engineers call?

The Permutit Company

440 Fifth Ave. **New York**

Water Softeners **Filters**
Iron Removal Apparatus

BRANCH OFFICES

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Pittsburgh, Pa., 921 Union Arcade Bldg.
Chicago, Ill., 208 South LaSalle St.
Kansas City, Mo., 401 Lathrop Bldg.
Minneapolis, Minn., 1046 McKnight Bldg.
Jacksonville, Fla., P. O. Box 604
Chattanooga, Tenn., C. C. Harding, Hotel Patten
Los Angeles, Cal., 404 Wright-Callender Bldg.

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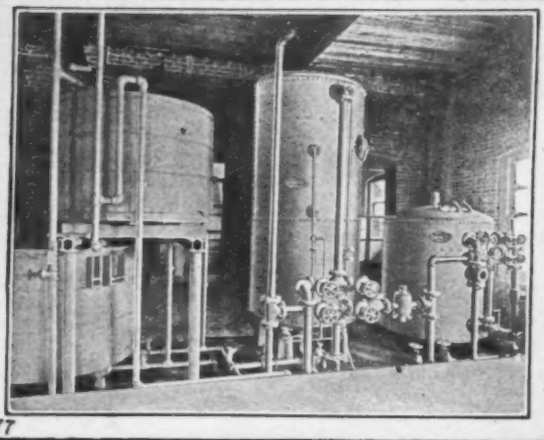

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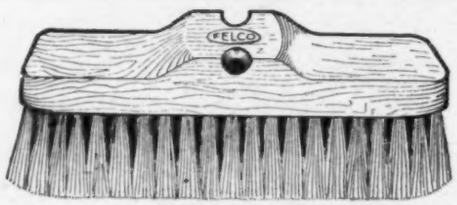

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Volume 84 Number 2

IN THE DAILY MAIL.

From the Vice-President of a North Carolina Knitting Mill:

"Please advise me where I can obtain the best small ice chests. We have established an ice plant in one of our mill villages and would like to be able to supply our employees with a good ice chest. If you could put me in touch with manufacturers of these chests, I would appreciate it greatly."

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From the President of a Georgia Cotton Mill, referring to the World Cotton Conference Number:

"Won't you please accept my congratulations on the very handsome issue of COTTON received this week? Not only is the typographical matter very attractive, but, in addition, the articles are most interesting."

From an Advertising Agency:

"We are just in receipt of copy of your October issue and wish to compliment you upon your success with same. It certainly is a land mark."

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TWENTY-FIRST ANNUAL REVIEW NUMBER

The Southern textile mills are completing what is generally recognized as one of the most successful years they have ever enjoyed in their history. They are running to capacity. They have organized and are building more new mills and additions than ever before started in a like period of time. Cotton mills, Knitting mills, and dyeing, bleaching and finishing plants have all shown their share of development.

The Southern manufacturers are looking forward to even a bigger and better year in 1920. After pointing out the basic reasons for the shortage of textile goods and the unparalleled demand, Mr. E. Kent Swift, treasurer of the Whitin Machine Works, in his address at the recent World Cotton Conference concluded:

"It is safe to prophesy that for the next four or five years, or perhaps for the next decade, our facilities will be taxed if we are to make up the astonishing deficit in production capacity. Fundamentally, the cotton industry today faces inevitably, in my opinion, great activity and prosperity."

The January ANNUAL REVIEW NUMBER of COTTON will be larger, broader and more interesting than ever before. Its important articles by authorities in the field, its views of the year's activities will insure its being read with more than usual interest. A copy will reach every textile mill of record in the Southern States. It will be consulted carefully for information.

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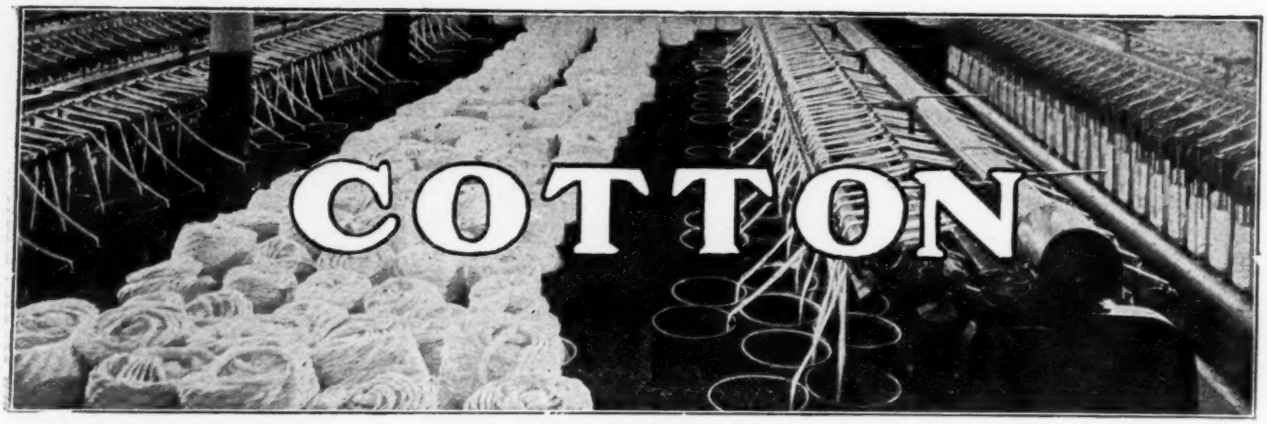

December, Nineteen-Nineteen:

Collective Bargaining.

In an article upon another page of this issue Dr. Leiserson indicates that collective bargaining and all that goes with it is the very heart and soul of industrial democracy; that the step from employee representation, through shop committees or other means, to collective bargaining and labor unionism is short and easy. Once taken such steps are most difficult and often impossible to retrace. Because of these undeniable facts it is well worth while to study the question from all angles before making any definite decision on the subject of divided control.

This question of collective bargaining was the rock upon which the President's industrial conference was wrecked. Nobody was disputing the right of labor to organize and bargain collectively, but there are a number of methods in use and the employer's group would not be led or coerced into approving a collective bargaining resolution which did not clearly define the methods and circumstances under which it would take place. The employer's group looked upon that resolution as a premeditated attempt to bargain for the steel workers, or to induce their group to accept a rule that could be used to force the Steel Corporation to recognize the American Federation of Labor officials in dealing with the striking employees.

Dr. Leiserson urges employers to beware of employee representation and shop committees unless ready for collective bargaining. But collective bargaining is not a panacea for labor troubles. A witness before the Senate Committee in its investigation stated that of seventy recent strikes within the Federation of Labor, only eight had been authorized. The recent strike of the coal miners affords an excellent example of the failure of collective bargaining. They did not wait until their present contract had matured, but like certain printers unions in New York, they had the power and despite their previous "bargain" or contract they struck for something better.

One of the railroad brotherhood chiefs is quoted as endorsing the action of the labor group in withdrawing from the conference, and also with saying that collective bargaining has been in force on the railroads for thirty years and has been successful. Those of us who have seen the administrative powers of this great country coerced by these same brotherhoods during a period of national stress, fully realize how they make use of the power they possess and "collective bargaining" does not describe what really happened.

Until organized bodies of men are incorporated or otherwise become legally responsible for the contracts or agreements entered into in their behalf by their authorized representatives, collective bargaining will continue to be, as frequently the case in the past, merely an unrighteous club in the possession of demagogues and mob leaders. If organized labor is to be given the right to paralyze the industries and commerce of this country whenever its leaders so please, then authority over our community life will have passed from the regularly elected representatives of the people into the hands of those leaders of organized labor. This is an unthinkable situation, but it seems to be the logical goal toward which we are now headed.

It is time for cool thinking, and COTTON will be glad to receive from all mill managers a clear enunciation of individual beliefs on this entire question of industrial democracy with its corollaries of employee representation and collective bargaining. These expressions will not necessarily be for publication, although many suggestions will doubtless be reproduced with or without the identity of the writer being disclosed. The ultimate end to be attained is a more thorough and complete illumination of the subject for the benefit of all concerned.

Repeal the Excess Profits Tax.

During the war it became necessary to fix prices on a number of commodities. This was done, but the price fixing committees found that the process of fixing a single, standard price on an article or unit of production allowed very much higher profits to a factory with a low cost of production than to another factory with a higher cost of production. If the price was lowered to suit the first type, the higher cost factories would necessarily have to suspend. As all of this production was needed on war work, it was decided to affix the higher price on all these commodities and with the aid of an excess profits tax to turn back into the treasury all profits over a certain amount that might be considered "undue profits." In other words, the theory was that by taking back 30 or 60 or 80 cents out of each dollar of undue profits a condition of private profiteering would be avoided and at the same time enough additional profit allowed to induce increased production to the limit of the facilities at hand.

Experience with this method of manufacturing seems to have demonstrated that the excess profits tax is one of the foundation piers upon which the present inflated and intolerable price structure has been reared. This top-heavy price structure works a hardship upon the consuming public as well as upon the business public. Also, the excess profits tax, insofar as it is a revenue producer, penalizes the factory with the conservative capitalization. Enterprise, initiative, mechanical ingenuity, ambition and hard work count for little if a firm does a large business upon a small capitalization. Conversely, a concern with an inflated capitalization is allowed a smaller tax rate and therefore secures a much larger rate of divisible profit.

The war is over. Price fixing in the majority of industries has become history. But the excess profits tax is, like a mill stone, still unjustly hanging around the necks of a multitude of manufacturers, destroying initiative, confiscating legitimate returns upon effort expended, and working a real hardship in many instances.

It should be repealed.

Increased Production Necessary.

The prospect of every American having a fair share of the things necessary to sustain life and make it worth living, depends in part upon the speed and quantity in which those things are produced. If we were able for a certain length of time to devote the whole of our productive powers to making useful things and nothing else, their cost would be reduced to a price which would enable everyone to have all required.

It is obvious that the wage earners of the country constitute the chief market to which producers must look for the purchase of the goods produced. In the main, it is necessary that we produce for ourselves and for others such things as we require, such as food, shelter and clothing. If a sufficiency of such things were produced, their prices would fall to a level where all might obtain what their necessities demanded.

The cheaper these things become, the less they take up of the wages of the workers, the more money is freed for the purchase of other things and a demand is created for fresh commodities. This demand furnishes further employment and additional wages. So this cycle continues to revolve indefinitely around Production. By increasing production the cost of living not only is decreased but employment is augmented and money is liberated to command less necessary things.

If we do not adopt every means of increasing output, if we do not abolish waste and diminish unnecessary expenditure, we must gradually impoverish ourselves as a nation. Unless we give a larger share of our national effort to production of necessities and save on luxuries that more capital may be released for plants and machinery for further production, conditions will be produced which will tend to lower the general standard of life of the wage earners in spite of higher nominal wages.

But the mechanical features are not the only ones to be considered, the production of the individual unit, the hours worked per day per man on machinery where time is the essence of production, is equally important. The employee producing without the aid of machinery may be able to force his production to a point where he may work less hours and still produce the same number of units, but this is seldom true of the employee at the machine.

A reduction in the cost of living rests with the producers of the country. When they fully recognize this fact and realize the absolute impossibility of "beating" fundamental economic laws, no matter how successful they may seem to be in "putting something over" on their employers, then we may look for a more sane and stable situation both in standards and costs of living.

Safety Devices Pay a Dividend.

Under the new liability insurance law which will go into effect in Pennsylvania on January 1, employees who may be injured will be entitled to an average of about one-third increase in benefits from compensation. Yet there will be no increase in the compensation insurance rates which hosiery manufacturers of the state will pay. This is not true of any of the other divisions of the knitting industry, and underwear manufacturers will be required to pay an increase of five cents per $100 dollars in payroll.

That hosiery manufacturers have escaped an increase is due to their having conformed in a general way to the recommendations of the liability insurance underwriters in the matter of installing safety devices and so training employees as to reduce the number of accidents to a minimum. The rate at present in force was based on an exposure of a $15,000,000 payroll in 1916. Wage disbursements in Pennsylvania hosiery mills in 1916 and 1917 amounted to $40,000,000, according to J. E. Van Doren, of the American Mutual Liability Insurance Company, and it is estimated that for the entire knitting industry of the state the disbursements for wages for 1918 and 1919 will total $85,000,000.

Solid Dreams.

Dreams are bubbles, but they can be turned into stuff more stable than granite. Many castles in Spain are based on the clouds, but they can be put upon a rock-bottom foundation.

Only the dreams of the idle are idle dreams. The dreams of the industrious and thrifty; the dreams that are dreamed in our waking hours and cherished in our thoughts, are promises for the future. They are the stern and solid stuff that life is made of.

But you cannot make dreams come true by just dreaming them. The bungalow in the suburbs, that college education for a growing son, that automobile, that new piano, can be materialized out of the ephemeral vapor of dreams and brought down to the more satisfactory basis of cold reality, but it requires effort that is far from dreaming.

In some measure money is required to make every dream come true. You must have money to take that long dreamed of trip through the Yosemite Valley, to build that home among the trees. Everything worth while in life must be paid for. If you can't pay now, wait—and save—until you can. Patience and the ability to see that it is better to go without something today in order to have something better tomorrow will make those dreams come true.

Thrift is the thing that will make solid everyday contentment and enjoyment out of the real dreams of life.

Another Angle on Industrial Democracy

BY W. M. LEISERSON.

Whether we call it "Organized Labor" or "An Organized Working Force," the subject we are to discuss is democracy in industry; and, as Prof. Commons says in his recently published book on "Industrial Goodwill"—

> Representative democracy in industry is representation of organized interests. Individuals who are not organized can not choose representatives. They must be content with their tacit proxies given to the organized. When once organized they can be consulted in advance of action. Procedure of autocracy is to act first and consult afterwards * * *
>
> But democracy can not quickly consult all individuals whose interests are affected. It comes as near as possible to doing this when it consults those who have been freely chosen for the purpose without interference from other classes, so that they really represent the interests of the class affected.[1]

The mistake we are likely to make in dealing with this problem is to assume that because industrial democracy necessarily involves an organized labor force capable of acting as a unit through its representatives, therefore every organization of working people in industrial plants is an example of industrial democracy. Committees and employee-representation plans are spreading rapidly throughout the industries of this country and employment managers as well as employers are assuming that all these organizations, no matter what their form or purpose, are providing industrial democracy for their employees.

As a matter of fact, however, a study of the employees' organizations now in existence will show that they classify themselves into three general groups, and the element of democracy is not present in one of them, nor is it present in each of the other two to the same extent.

Last month we printed an address on industrial democracy as well as some comments thereon. As the subject seems to prove of interest to the average mill manager, we are presenting herewith another opinion showing where it will lead.

The accompanying extracts are from an address delivered before the National Association of Employment Managers by Dr. Leiserson, who is chief of the Division of Labor Administration, Working Conditions Service, U. S. Department of Labor.

The subject of his address was "Employment Management, Employee Representation, and Industrial Democracy." His views are of especial interest because he represents the attitude of the Department of Labor, which, as is well understood, is not inimical to labor unionism.—Editor.

The first group of employees' organization plans may be called welfare committees or shop committees proper. These are merely advisory organizations of the working force selected by either the management or the employees for the purpose of conferring with the foreman, with safety directors or personnel and service managers regarding problems related to working conditions in the plants. The matters with which these committees are concerned are primarily safety and welfare work with a small number trying to extend their activities to include grievances. Although these committees are constantly hailed as examples of industrial democracy, they involve no element of collective bargaining or joint control over terms and conditions of employment. Complete authority is centered in the management; the committees merely giving advice and suggestions which may or may not be accepted by the management. The powers, functions, and methods of operation of these committees identify them with the service work of the plants rather than with problems of bargaining, of wages, hours, and shop discipline, which, as I shall show presently, are the subjects that must be handled, and to an extent controlled, by any organization that pretends to provide democratic control of industry.

The second group of organizations may be called "employers' unions." In this group are included all those plans which either explicitly say, as does the Midvale Steel & Ordnance Co. plan, "We recognize the right of wage earners to bargain collectively with their employers * * *," or which by implication recognize the principle of collective bargaining between the employees and their employers, as do the plans of the Bethlehem Steel Co., the International Harvester Co., and the Colorado Fuel & Iron Co. The employers' organizations in this group represent a long step in the direction of industrial democracy, for they involve getting the consent of the employees who are the governed in industry, in the making of industrial laws. You remember that our Declaration of Independence says that government derives its just powers from the consent of the governed. As political democracy provides for the consent of the governed in the State, so industrial democracy will provide for the consent of the governed in industry. The difference between these "employers' unions" and the ordinary unions known as "organized labor" is that the former are initiated by the employers; they are confined to one company rather than connected with a national organization of employees, and the management is not excluded from the meetings.

The third group of organized workers are the ordinary labor unions, and they usually involve written or understood agreements between national unions of the employees and individual firms or associations of employers. The agreements invariably cover wages and hours and usually working conditions as well.

However much the employer whose workers are included in the third group may object to the principle of collective bargaining, he understands thoroughly that his agreement with the union involves that principle. In the second group, however, in the plans we have called "employers' unions," there is not always this clear understanding on the part of the employer of what his employees' organization involves. Where the principle of collective bargaining is present only by implication, as is true in practically all the plans except that of the Midvale Steel Co., it quite often happens that the employer does not realize that his plan involves this principle. The employees, however, usually assume it does not mean anything unless it

gives them the opportunity to bargain collectively with their employers. It is hardly necessary for me to point out to a group of employment managers that any misunderstanding like this of the purposes of a plan of employee representation is likely to cause trouble between employer and employee, making the employees feel that they have been deluded, while the employers are likely to think that the workers are ungrateful for all the things the management has been trying to do for them.

In spite of the danger in misunderstandings of this kind, a deluge of shop committees and employee-representation plans is flooding the country. Employers, feeling unrest and distrust among their employees, are seizing on these plans as a sort of panacea for all their labor troubles without clearly analyzing their troubles and the nature of the remedies. Employment managers—and labor experts also, I am sorry to say—are zealously advocating representative committees as if the mere organization of these would of itself solve any labor problem. A great many of our labor difficulties are caused by poor labor management. Democratic organizations of employees will not remove these. Only good management will help in such cases. Employees' organizations are needed to deal with labor troubles that arise under the best management, that grow out of the democratic movement in industry.

Before attempting to deal with organizations of his employees the employer ought to have a thorough understanding of the labor question. He must analyze the relations between his own management and his working force, and he must have complete knowledge of the labor administration machinery already existing in his plant, which labor relations this machinery is designed to handle and which it is not equipped to handle. This is the diagnosis part of the job and, unfortunately, diagnosing the industrial ills in a plant is usually neglected by both employers and labor experts. Remedies are applied because of their supposed general healing powers, and just now shop committees seem to be the most popular of these patent medicines. You may have heard of the country doctor who, when he did not know how to diagnose a case, gave his patients a concoction to throw them into fits. And he had a good remedy for fits. We must avoid thinking that all labor troubles are just fits that can be cured by one remedy like committees.

Let us, therefore, try to analyze the relations between employers and employees, and see if we can find out the nature of various kinds of industrial ills and which of these can be removed by organizing the working force. In any plan or policy of labor management for industrial enterprises two sets of labor relations must be clearly distinguished. First, the personal relations which present the personnel management problems; and, secondly, the economic collective relations which cover the problems of bargaining and democracy. The names I have given to these are not very apt, but the different kinds of relations exist and must be dealt with in different ways. Perhaps we can get the distinction more clearly if we describe in more detail the two sets of labor relations.

What I have called the personal relations presents the problem of managing human beings in industry. It means handling the human element that goes into production with the same understanding of the feelings, instincts, prejudices, and characteristics of the workers as the management has of the materials and mechanical forces which it uses. The personal relations in industry cover such questions as hiring, selection, placement, training, promotion, treatment by foremen, health, safety, recreation, lunches, rest periods, etc. These conditions, as we shall see presently are not essentially controversial in nature; they do not involve conflicting interests and they have to be settled by good management and scientific experts rather than by democratic decisions of majorities.

The second set of labor relations, those which I have called the economic or collective relations, presents quite a different problem. It has to do with the division of the product of industry, with the government or control of industry, with bargaining, wages, hours, unionism, and shop discipline. The return that workers should get for their labor, the number of hours they shall work for what they get, the authority they shall have in fixing terms and conditions of employment, the voice they shall have in making disciplinary rules and punishing infractions of such rules —these are questions that present controversial issues which can not be settled by any technical expert. They are matters which require democratic decisions and about which a wide diversity of opinion will be permitted in any democratic system of industry.

The personal relations in industry divide themselves further into two sets of problems, First, the employment problems; secondly, the service problems. The employment problems require an administrative organization—commonly called a centralized employment department—for properly recruiting the work force, selecting and placing the workers, intelligently training them and educating them in their work, and providing an adequate system of promotion and transfer to give advancement to the ambitious and the capable, to make readjustments for those unsuited to certain work or to certain foreman, and to provide steady employment when the amount of work in different departments of the plant fluctuates.

The service problems are somewhat different from these. They arise from the mere fact that a large number of human beings are congregated under one roof and the management must provide a service organization to meet the human needs that develop under such circumstances. Health problems arise, sanitation and medical care is needed. Safety must be looked after and compensation for accidents provided. Then there is the education and protection of the foreigner, the illiterate, and the juvenile employees; providing eating, rest and recreation facilities, insurance and pensions, maintaining and building up morale. While the service and employment problems differ somewhat in nature, they are alike in that they do not present essentially controversial questions. They are two phases of the personal relations in industry; both are personnel management problems rather than economic problems of democracy or government.

Whether we have a system of privately owned industry or Government ownership, or socialism or bolshevism, these problems remain the same. How to manage the working force with due regard to the fact that it is made up of human beings and not some abstract thing called "labor," how to provide for their human needs and how to use their characteristics, feelings, instincts, ideals, and ambitions to get the greatest amount of production—these are problems that confront not only the private industrial manager—Mr. Burleson is up against them too, and so is Lenin, the Bol-

shevist, and Tchaikowsky, the moderate Socialist. Democracy is not the problem here—the problem is scientific, efficient management. In these matters of purely personal relations final authority may be safely lodged in the hands of experts and scientists.

We have made some progress in this direction in the matters of safety and sanitation. Employers and workers are generally agreed that every place of employment should be as safe and sanitary as it is possible to make it. What constitutes a safe and healthful place of employment is a subject for the safety expert, the sanitary engineer, and the medical man to decide after research and investigation rather than for a decision by a democratic majority. It is easy to see that safety and health problems are technical and not essentially controversial, and that the same holds for the other welfare or purely service problems will also be admitted. But it is not so obvious that the other phase of the personal relations, the employment problems, are also technical and need to be handled by experts and scientific men.

We have a notion that everything in the world is natural except human beings. The materials and the mechanical forces used in industry work according to their natural characteristics and the laws of their being. but humans, we think, act any old way, and if they are employees they ought to do anything the employer expects of them. A manager would never expect wood or concrete to stand strains and do work that only steel can do. He will employ a trained man who understands these materials to decide the different uses to which they are put. But while the manager will say that there are lots of workmen with wooden heads, he seldom thinks of employing a trained man who knows the difference between wooden-headed men and other different kinds of men to decide the different uses to which they shall be put. Qualities, characteristics, and capacities of human beings are subjects of scientific study just as are the qualities and characteristics of materials or steam or electrical power. As we expect an engineer to know something about the boilers or turbines he handles, so we ought to expect the men who want to manage the human engines to know something about the emotions, the intellects, the capacities and the resistance power of human beings. Slowly we are beginning to realize this and the movement for expert employment managers is the best evidence of this.

But the employment manager or human engineer is a technical man like the safety expert, the medical man, or the sanitary engineer. He is not a statesman or a politician and it is not his function to deal with questions of democratic control or government of industry. Moreover, the better expert he is at his employment work the less qualified he is likely to be at the controversial questions that comprise the second set of labor relations, which we have called the economic collective relations in industry. He is likely to try to decide these by absolute scientific laws when they are very much a matter of opinion and bargaining power.

Committees of employees may be used by the technical men who handle the personal relations in industry, but they are not the same kind of organizations of employees that are needed to deal with the economic or governmental relations. The first can be permitted to offer to the management only advice and suggestions. The second must have a veto power on the acts of the management and will sooner or later demand an equal voice in determining wages and hours and controlling discipline. What we have earlier in this paper called shop committees proper are nothing more than advisory committees on employment and service problems. Welfare committees might be a better name for them. They deal with personal problems only, with personal management questions; yet either in ignorance or as a subterfuge they are commonly offered to employees as industrial democracy.

This is playing with fire, or with dynamite, if you prefer that. Any employer who is not ready for collective bargaining, who is not looking toward turning over to his employees 50 per cent of his control over terms and conditions of employment had better beware of shop committees. If he desires merely to improve the personal relations between his management and his men, if he wants only to be brought into closer contact with his employees for the purpose of insuring a square deal to them *as he sees it*, if he wants to see that justice is done to every employee *as he sees justice*, then all he needs is a good employment and service organization. What he wants to accomplish can best be done by expert employment and service managers. Shop committees are not at all necessary and they are likely to confuse the managers with issues of democratic control of industry while the employees may be misled into thinking they are going to have a real voice in the management and become resentful and rebellious when they find out the truth. If these advisory shop committees are used in personnel management work it is very important that most careful explanations be made to the employees so that they will not misunderstand.

It is always dangerous for an employer who wishes to maintain personal control of his business to use representative committees, which are a device of industrial democracy. The administrative machinery of such committees is designed primarily for the collective action required in dealing with the economic or governmental relations in industry. Only when he is ready to administer justice to his employees as they understand justice, only when he is ready to give them a veto power on his act and to insure them a trial by their peers, a jury of fellow employees, should an employer inaugurate an employee-representation plan. For once he begins to deal with governmental relations in industry he must create wage-fixing committees of employees, arbitration boards, and impartial umpires. In a word, he must be prepared to give up his exclusive control over wages, hours, and shop discipline.

Perhaps you still doubt my statement that representative committees are essentially devices of unionism and collective bargaining. Perhaps you think I am not justified in calling the employee-representation plans "Employers' Unions." Let me, therefore, support my statements with citations from the experience of England and America with works committees.

The United States Shipping Board has published a report of an investigation of "Works Committees and Joint Industrial Councils" and finds that—

> Works committees have evolved out of certain shop practices and organizations of union labor. * * * It is evident that the institution of shop or works committees will be easiest where both employers and workmen are already accustomed to collective action through trade-union organization. This fact explains the comparatively large number of committees in English establishments and their paucity in American industry. * * * In England the movement has developed quite naturally upon the basis of the craft or shop stewards so that the backbone of the committee system there may be said to be an already existent trade organization.[1]

The Whitley committee, appointed in England to report

[1]Works Committees and Joint Industrial Councils. A report by A. B. Wolfe, U. S. Shipping Board, Emergency Fleet Corporation, Industrial Relations.

on industrial reconstruction problems, which has done more to popularize shop committees than any other single cause, insists throughout its reports that works committees should be based wherever possible on union organization. It says:

> Our proposals as a whole assume the existence of organizations of both employer and employed and a frank and full recognition of such organizations. Works committees established otherwise than in accordance with these principles could not be regarded as a part of the scheme we have recommended, and might, indeed, be a hindrance to the development of new relations in industry to which we look forward. We think the aim should be the complete and coherent organization of the trade on both sides, and Works Committees will be of value in so far as they contribute to such a result.[1]

The American Federation of Labor understands it that way, too, for it has officially gone on record for an arrangement whereby—

> First, a committee of the workers would regularly meet with the shop management to confer over matters of production; and whereby,
> Second, such committee could carry, beyond the foreman and the superintendent, to the general manager or to the president, any important grievance which the workers may have with reference to wages, hours, and conditions.[2]

And the National War Labor Board which made collective bargaining a basic principle of its work coupled this principle with shop committees in most of its decisions. Again and again it used the following words in its awards:

> As the right of workers to bargain collectively through committees has been recognized by the board, the company shall recognize and deal with such committees after they have been constituted by the employes under the supervision of an examiner of the National War Labor Board and by a method of election prescribed by the board.

Finally, we have the opinion of the vice president of the American Rolling Mill Co., summarizing years of experience:

> Where the men are organized I think this plan can be operated very successfully, but where the men do not belong to our organization and are not responsible to an organization made up of their fellow workmen, I doubt the success of the committee plan as a regular policy.[3]

Assuming that employers are convinced that organizing representative committees in their plants means collective bargaining and unionism, should they try to keep the employees they organize into works committees away from the regular labor unions? Will employers' unions be perpetuated as substitutes for organized labor or will these employers' unions develop into bona fide labor organizations?

On this point let me quote the Whitley committee again:

> We think it important to state that the success of the works committees would be very seriously interfered with if the idea existed that such committees were used, or likely to be used, by employers in opposition to trade-unionism. It is strongly felt that the setting up of works committees without the cooperation of the trade-unions and the employers' associations in the trade or branch of trade concerned would stand in the way of the improved industrial relationship which in these reports we are endeavoring to further.
> In an industry where the work people are unorganized, or only very partially organized, there is a danger that works committees may be used, or thought to be used, in opposition to trade-unionism. It is important that such fears should be guarded against in the initiation of any scheme. We look upon successful works committees as the broad base of the industrial structure which we have recommended, and as the means of enlisting the interest of the workers in the success both of the industry to which they are attached and of the workshop or factory where so much of their life is spent. These committees should not, in constitution or methods of working, discourage trade organizations.[4]

Please note the insistence that the essential purpose of any attempt to organize the working force—namely, the improvement of relations between employer and employee—will be defeated if works committees or representation plans are to be used as a substitute for organized labor or as a means of destroying it. This is the point I wish to emphasize, in conclusion, also. And you will note in all the intelligently prepared employee-representation plans a clause to the effect that these plans shall not abridge or conflict with the right of employees to belong to labor unions.

The labor organizations that make collective agreements with employers covering wages, hours, and discipline are here to stay. It is their practices that gave rise to shop committees and they will grow in power and prestige with the extension of the committee and employee representation plans. There can not be complete industrial democracy until bargaining power is equalized between the management that owns a thousand jobs and the man who wants to hold one of these. To bargain on equal terms the thousand men must act as one in dealing with the management. And there can be no such unity until the employees are organized independently of the employer.

Let not this statement, however, mislead you into thinking that I am advocating trade-unionism to you or to any employer. I am advocating only that the employer should know what he is about when he begins to form organizations of his employees. I point out the democratic trend in industry to show you what you are headed for once you get away from the purely personnel management questions and pass over into the domain of collective and democratic relations between employer and employee. It has been my purpose in this paper to point out that personnel management, the handling of the employment and service problems in a plant, however scientifically and efficiently this may be done, can not meet the demands of democracy in industrial relations. Mere welfare committees attached to such management is not democracy and when an employer thinks or pretends that it is he is preparing trouble for himself. If he is not ready to give up personal control of justice let him beware of any employees' organization. Once he starts with committees he is on the road to unionism, and he can't stop or go back. Welfare committees in England, the Whitley report shows, have prepared the way for works committees and a strengthened unionism. In this country the employer will find that our shop committees tend to become employers' unions, and these will develop into labor organizations, independent of the employer, to complete the trend toward industrial democracy.

The American Textile Banding Co., Inc., Hunting Park Ave. & Marshall Street, manufacturer of spinning and twisting tapes, has leased 25,000 square feet of floor space in a mill building at Belfield Ave. & Wister St., Germantown, Philadelphia, Pa. The company will occupy these new quarters about the first of next year. The output of the company is to be doubled. In addition to the regular line of spinning and twisting tapes, automobile fan belts and anti-squeak webs will also be manufactured. "Amtex" is the trade-marked name which will be applied to all the products of this company. At a recent meeting, Edward Jefferson was elected president, continuing also in the office of treasurer; Miles P. Hoffman, vice-president and Harry Jefferson, secretary. The offices of this company will be continued at 23 South Second Street. It is planned to increase the capitalization from $20,000 to $100,000.

"The Clutch that Clutches" is the title of a 16-page booklet recently issued by the Medart Patent Pulley Co., Inc., with general offices and works at St. Louis, Mo. This book contains matter descriptive of the V-groove friction clutch and other products manufactured by this company and gives adequate illustrations of these clutches as installed in various manufacturing plants.

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[1]Report of an Inquiry as to Works Committees. Reprinted by U. S. Shipping Board, 1919, p. 16.
[2]Thirty-eighth Annual Report of the American Federation of Labor, 1918, p. 85.
[3]United States Shipping Board Report, p. 159.
[4]Report of an Inquiry on Works Committee, p. 127.

Cotton Manufacturing in China

By B. Y. Lee*

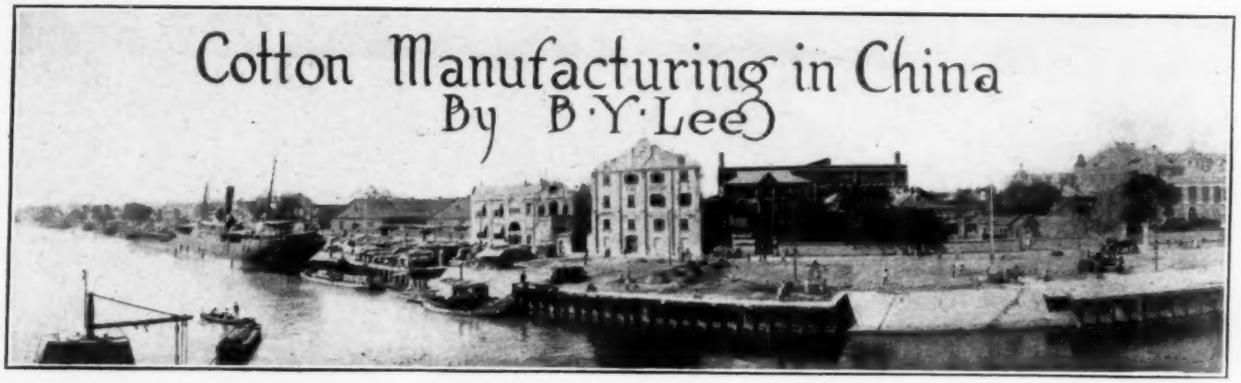

Photo by Brown Bros.

ON THE WATER FRONT AT TIENTSIN. THE WHITE BUILDIN GS ARE COTTON WAREHOUSES.

China is the greatest market for cotton yarn in the world and the second largest market for cotton piece goods. During the last ten years the imports of cotton goods into China amounted to the sum of about $150,000,000, or approximately 30 per cent of her total imports. China claims to be ranked the third in the world's production of cotton. The total number of spindles in China has appeared in many periodicals as being "about 1,000,000," or "a little over 1,000,000," etc. Her exact position in the cotton manufacturing world is little known to American textile men. For those reasons and many others many Americans say "it is a Chinese puzzle." After reading the following paragraphs, the reader may find that his puzzling in these points will be somewhat untangled.

In order to understand the cotton manufacturing situation in China clearly, thoroughly and exactly, let us first review in brief its history from A to Z and trace the different stages of its development. In 1890 the first Chinese modern cotton mill was erected in Shanghai by the late H. E. Li Hung Chang, the greatest Chinese statesman known to foreigners. Its total capital was about $600,000 Mex. and was subscribed by the high officials of that time. Its number of spindles is not known but is assumed to have been about 1,800. Everything went along nicely for nearly three years after the construction, September, 1893, when a fire broke out in the mill. The buildings were destroyed and the machinery completely ruined. The mill disappeared, but the spirit of the modern industry was not entirely extinguished.

Li Hung Chang was, then, the father of Chinese cotton manufacturing. He sowed the seed for present day Chinese to reap. Immediately after the disaster, Li's assistant tried hard to start another mill with the help of his employer. Opposition and discouragement were met with everywhere. In 1894, a year after the burning of the first mill, another mill of 65,000 spindles and 600 plain looms was erected in Shanghai. In the same year a mill in Hupeh and another in Shanghai consisting of more than 25,000 spindles were erected. In 1895 two more mills were erected. The start of the modern cotton industry in China really began here.

Prior to 1895 no foreigners were allowed to operate mills in Chinese territory. In 1895 a treaty granting the right to foreigners to import machinery of all kinds and to engage in the manufacturing industries in the treaty ports of the country was signed. The following mills were erected in Shanghai by foreigners in 1896, according to a Chinese source.

Name of mills.	Spindles	Capital.
Soy Kee Spinning Mill (German)	40,000	1,000,000 taels
Laou Kun Mow (British).....	25,000	720,000 taels
Ewo Cotton Mill (British).....	50,000	1,500,000 taels
Hang Yuen Mill (American)....	40,000	1,000,000 taels

For some reason the management of the latter mill was changed. The total number of spindles at this time was little over 400,000, and over 2,000 looms, including both Chinese and foreign, were installed. Many Chinese mills passed through the hands of the Japanese and many new ones sprang up in different centers, such as Tungchow, Soochow, Ninpo and Wuchang.

These years of prosperity were followed by years of industrial depression or what is termed in economics, industrial crises. The foreign capital overwhelmed the country with the establishment of large mills, while those of the Chinese were inadequate and too small to meet the competition. Consequently many Chinese mills were forced to shut down temporarily or suffer financial loss. This was the first and also the greatest industrial transitional stage from handicraft to modern industrialism. The causes were to found partly in the division of labor and the time using or capitalistic method of production; and partly in some elemental traits of human nature. They were partly economic, partly psychological.

During the period of expansion of nearly ten years, from 1896 to 1905, the infant industry was hammered in all directions. There was no cooperation among the native manufacturers, no government help of any sort, such as protection against imported goods. Economists have generally admitted that there is a certain amount of truth in this assumption. If an industry gets an early start in a given district, this locality is likely to retain its advantage because of the concentration at that point of capital and labor. It should be remembered that the imported duty on foreign goods in China has been restricted on account of a treaty and could not be raised or lowered according to conditions. In 1905 the industry became active once more. All mills which had once suffered from financial loss now became prosperous. More new mills were erected in various provinces, Chili, Hupeh, Hunan, and Chekiang.

At the dawn of the establishment of the Republic, the Chinese cotton industry was in the full swing, on account of the encouragement given by the government and because of a self-realization on the part of the people themselves

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Year	No. of Chinese mills.	No. of foreign mills.	No. of spindles in Chinese mills.	No. of spindles in foreign mills.	Total No. of spindles	Annual production in piculs.*
1894	1		65,000		65,000	
1896	8	5	225,267	204,342	429,609	
1902	12	5	302,240	207,694	509,934	
1906	17	5	426,767	214,157	640,924	
1907	21	6	501,298	254,638	755,936	900,000
1908	21	7	512,163	271,943	784,100	1,050,000
1909	22	7	541,279	280,034	831,313	1,050,000
1910	22	7	524,009	300,094	834,103	1,050,000
1911	24	8	601,700	302,546	904,246	750,000
1912	24	8	580,341	304,786	885,127	1,200,000
1913	24	10	593,191	370,841	964,032	1,200,000
1914	26	10	651,984	371,911	1,023,895	1,600,000
1915	29	10	700,014	390,192	1,090,206	2,000,000
1916	30	11	721,105	400,146	1,121,251	2,000,000
1917	30	11	740,091	482,142	1,222,233	2,200,000
1918	31	11	765,091	483,500	1,248,591	2,400,000

*A Picul equals 133⅓ pounds.

toward this important industry. The competition of the experienced foreign manufacturer, especially that of the Japanese and British, was then encountered. More foreign mills were erected in Shanghai. On account of the efficient management, broad technical experience and the large supply of capital of the foreign interests, the native owned mills suffered loss once more. In spite of all these disadvantages, the Chinese mills have been kept going very well, although they are not so prosperous in comparison with the foreign managed mills. The preceding figures give the list of all the cotton mills in China either under Chinese or foreign management together with the number of spindles and their annual production from 1894 down to 1918:

These figures show that at the present time there are one million and a quarter spindles already in operation besides those under construction. Out of this total number of spindles in China, foreigners own nearly 40 per cent. The number of mills managed by the Chinese is about three times as that owned by foreigners, but these of the latter are considerably larger in size According to the theory of large scale production, the foreign managed mills have many advantages over the Chinese owned mills. But the latter would be making a fair profit if they were under honest management. It is also worthy of note that the average number of spindles in each of the foreign owned mills is 44,000, compared with about 22,000 per plant in the Chinese owned mills. The average foreign owned mill, therefore, is about twice as large as the average Chinese owned mill.

The following list gives the names, location, number of spindles, looms, initial capital and the year in which they were erected of all the Chinese cotton mills already in operation at the present time:

Mills	Location.	No. of Spindles.	No. of Looms.	Year in which Erected.
Heng Foong Mfg. Co.	Shanghai	15,576	350	1895
San Sing Cotton Mill	Shanghai	65,520	1,106	1894
Yu Yuen Cotton Mill	Shanghai	26,926	250	1895
Poa Tung Cotton Mill	Shanghai	18,200	300	1900
Anglo-Chinese Mfg. Co.	Shanghai	13,200		1906
Heng Chung Cotton Mill	Shanghai	9,392		1907
Dong Chung Cotton Mill	Shanghai	11,200		1908
Teh Dah Cotton Mill	Shanghai	37,368		1914
Hang Yui Cotton Mill	Shanghai	23,000		1914
Shun Sing Cotton Mill	Shanghai	20,000	400	1915
Eastern Mill, formerly German, now Chinese	Shanghai	50,768	250	1895
Hou Sung Cotton Mill	Shanghai	25,000	300	1918
Chung Sing Cotton Spinning Co.	Wusieh, Kiangsu	45,000		1906
Kwang Ching Cotton Spinning Co.	Wusieh, Kiangsu	20,500		1916
Yih Ching Cotton Spinning Co.	Wusieh, Kiangsu	15,000		1896
Dah Sung Old Mill	Tungchow, Kiangsu	60,000	350	1897
Dah Sung New Mill	Tungchow, Kiangsu	20,000	200	1914
Dah Sung Mill No. 2	Tsungming, Kiangsu	26,500		1910
Soo Lon Spinning Co.	Soochow	21,500		1896
Tsi Tai Cotton Spinning Mill	Taitsang, Kiangsu	13,200		1906
Lee Yung Cotton Spinning Mill	Kiangyin, Kiangsu	16,000		1908
Yu Tai Citton Spinning Mill	Changsu, Kiangsu	15,000		1908
Yui Sing Cotton Spinning Mill	Changsu, Kiangsu	10,192		1907
Tung Wai Kung Spinning Mill	Siaosham, Chekiang	13,000		1906
Ting Sing Cotton Spinning Mill	Hangchow, Chekiang	21,016		1897 & 1906
Tung Chiu Yuan Cotton Spinning & Weaving Co.	Ninpo, Chekiang	18,800	216	1895
Ho Feng Cotton Spinning Mill	Ninpo, Chekiang	23,600		1906
Kwong Yih Spinning Mill	Changtefu, Hunan	47,000		1909
Chihli Cotton Spinning Mill	Tientsin, Chihli	10,000		1914
Hupeh Government Spinning & Weaving Mill	Wuchang, Hupeh	90,000	800	1895
Total		793,486	4,522	

It will be noticed that out of the total number of thirty-one Chinese mills, 12 are located in Shanghai, and 11 in the Kiangsu province or in the neighborhood of Shanghai, thus making 23 of the total number, or 66 per cent of the Chinese cotton mills in the empire province. In view of this fact, the cotton manufacturing supremacy of Kiangsu has been flourishing from the beginning of the Chinese cotton industry until the present time and certainly this supremacy will continue for years to come and perhaps become even greater in the future. In the northern provinces the mills are still scattered, but in certain localities they have grown faster than others. Tientsin and Tsinanfu, Shantung, are rapidly becoming great cotton manufacturing centers. In the southern provinces this industry is still unknown on account of lack of supply of cotton and the high rates of transportation.

The reasons for the more rapid growth of the industry in Kiangsu, especially in the city of Shanghai, are the advantages which accrue from centralization in general, and the natural advantages possessed by the different localities in particular. The first, if not the principal reason, is ample supply of native cotton in this province. Long before the modern industry was developed, the old style methods of spinning and weaving were prosperous in this section. The secondary factors are: nearness to market and supplies of labor and capital. Since the Nanking-Shanghai railway has been open for traffic, the industry has been rapidly moving on this line. On account of the quick method of transportation, many towns within a couple

of hundred miles of Shanghai are becoming sort of suburbs of Shanghai.

Practically all the large foreign importers have had their headquarters in Shanghai, and the Chinese merchants all over China have their selling and buying agents there. Agents for both British and American textile machinery are located at this place. The port possesses more commercial machinery than any other city in the country and also possesses unusual shipping facilities for foreign and domestic trade. A favorable geographical location has helped to give Shanghai its enormous commercial supremacy and industrial expansion in North, West and Central China. Factories and mills are not subject to the taxes of the country. For these reasons and others the foreign managed mills, without exception, are located in Shanghai. A list of mills of the different nationalities in Shanghai follows:

Mills	Management	No. of Spindles	No. of looms.
Ewo Spinning & Weaving Mill. Erected in 1895	British	74,420	709
Yangtzepoo Cotton Mfg Co. Erected in 1912	British	55,632	446
Loau Kung Mow Spinning & Weaving Co. Erected in 1895	British	40,096	300
Kung Yik Spinning & Weaving Co. Erected in 1908.	British	25,367	400
Sino Chinese Cotton Mill. Japanese. Formerly Chinese. Erected in 1895	Japanese	53,205	500
Shanghai Cotton Mfg. Co. No. 1. Erected in 1906.			
Shanghai Cotton Mfg. Co. No. 2. Erected in 1908.	Japanese	140,892	881
Shanghai Cotton Mfg. Co. No. 3. Erected in 1916.			
Naigai Wata Cotton Mill. No. 12, Erected in 1912.			
Naigai Wata Cotton Mill. No. 34, Erected in 1913.	Japanese	130,000	1,000
Naigai Wata Cotton Mill. No. 56, Erected in 1916.			
Total No. of Spindles 519,612, Looms 4,226			

The following is a list of Chinese mills which are under construction and are not yet in operation either due to one or all of the following reasons: (1) Buildings having not been completed; (2) Machinery having not arrived; (3) Not having enough capital.

Mills	Location	No. of Spindles	No. of Looms.
Poa Yit Spinning Mill	Shanghai	42,000	250
Wing Yuen Spinning & Weaving Co.	Shanghai	10,000	200
Dah Sung Cotton Mill No. 3	Haimenting, Kiangsu	30,000	
Hankow Cotton Mill No. 1	Wuchang, Hupeh	40,280	500
Changsha Spinning Mill No. 1	Changsha, Hunan	40,000	
Yep Sing Spinning Mill	Shasi, Hupeh	50,000	
Yu Hung Cotton Spinning Mill	Tientsin, Chihli	15,000	
Heng Tueng Spinning Mill	Paoting, Chihli	1,200	
Lou Fung Spinning & Weaving Mill	Tsinanfu, Shantung	25,000	
Wa Sing Cotton Spinning Mill	Tientsin, Chihli	25,000	
Poa Tung Cotton Spinning Mill	Shanghai	30,000	
Chengchow Cotton Spinning Mill	Chengchow, Hunan	20,000	
Wuhu Yu Chung Spinning Mill No. 1	Wuhu, Anhwei	15,000	
Total No. of Spindles		343,480	Looms 950

The following is the list of Japanese mills which are already planned, but are not yet in operation:

Mills	Location	No. of Spindles	No. of Looms
Japanese Spinning Mill	Shanghai	30,000	
United Spinning Mill	Shanghai	20,000	
Naigai Wata Cotton Mfg. Co. No. 7	Shanghai	20,000	600
Yu Yue Spinning Mill (Chinese and Japanese)	Tientsin, Chihli	50,000	
Naigai Wata Cotton Mfg. Co. No. 8	Tsingtao, Shantung	20,000	
Total No. of spindles		120,000	Looms 600

The following lists show the grand total number of spindles and looms in operation and those under construction in China up to the present time:

In Operation.

Spindles	*Looms*
793,468 (Chinese)	4,522 (Chinese)
519,612 (Foreign)	4,226 (Foreign)

Under Construction.

343,480 (Chinese)	950 (Chinese)
120,000 (Foreign)	600 (Foreign)

Besides those already mentioned, the foreign textile agents in Shanghai, such as Anderson and Meyers, representing Saco-Lowell machinery, British agent for Howard & Bullough machinery, etc., have lately taken orders for about 100,000 spindles from Chinese cotton manufacturers in different parts of China The names and exact locations of these newly proposed mills are not known, but it is safe to say that there are 1,776,560 spindles and 102,980 plain looms in China. It would not be surprising if these numbers were doubled within the next few years.

Japan is undoubtedly using all its strength to push this industry in China as well as in Japan. Since the war began Germany is eliminated from China and the only foreign competitors on Chinese soil are the British and Japanese. The former have been very active and energetic in this industry in the past, but not so much recently. The greatest and most powerful foreign competitor is the Japanese, who is trying not only to monopolize the cotton manufacturing in China, but to control the raw cotton supply as well. Last year, two mills, one British and the other Chinese, were purchased by the Japanese spinners. They now have ten big mills in Shanghai besides those at Tientsin and Tsingtao. At Tientsin a joint undertaking was started not long ago to establish a cotton mill and was backed by many well known Japanese firms.

The Cotton Manufacturing Centers in China are Indicated by the Dots.

Provinces With Shaded Lines are the Cotton Growing Centers in China.

The Chinese and Japanese cotton markets are very closely related and conditions at the present time are such that the price of raw cotton in the Shanghai market fluctuates very sharply. Both of these markets, however, are influenced to a greater extent by the market in America than they influence each other. In Japan there is a system of forward sales of yarn known as "sampin," and whenever, as a result of speculation, there is any fluctuation in the yarn market in Japan there occurs a corresponding change in the yarn market in China, and naturally the price of raw cotton moves in close sympathy with yarn prices. The cotton operator in China, in order to be successful, must be more expert in this line of business than he would have to be in any other market in the world. In China there is no association of any kind to determine classifications of the raw material and there is no fixed standard; and the natural result of such a state of affairs is that operations in the cotton market in China, and in Shanghai particularly, are attended with an enormous amount of risk.

Photo by International Film Service.

A MILL INTERIOR. NOTE THE DOFFING BASKETS AT THE RIGHT.

Cotton Growing in China.

The Chinese mill owners, having struggled and suffered very much to maintain themselves in the world-wide competition, now begin to realize how serious is the necessity of improving the quality and growth of Chinese cotton, as well as closer cooperation among their fellowmen. "Slowly but surely we will reach the goal," a prominent mill owner once said.

Cotton is grown in Shantung, Chekiang, Honan, Hupeh, Sechuan and Kiangsu, but little science has been applied to the cultivation, and little has been done either to suit the seed to the soil or to improve the length of staple. The present high average per acre is reported to be 180 pounds cleaned or 490 pounds seed cotton. According to careful estimates made in the south-westerly provinces, it would seem that there is an area of about nine million acres available for the cultivation of cotton and if irrigation was employed this might perhaps be increased to eleven million acres, while the Yangtze province and Shantung there are about sixteen million acres under cultivation so that in those provinces there would appear to be about twenty-six million acres, which if properly cultivated should yield at least 1,520,000 tons of cotton annually, enough at least to provide China with all the coarser counts of twist drills, shirtings, etc., needed.

This can be accomplished with the aid of the government and the acquiring of scientific knowledge by the cotton growers. During the last few years, many cotton experimental stations were established by the government in the various cotton growing centers and an American cotton expert has been appointed for the further improvement of the native cotton. Recently a large quantity of selected cotton seed was sent out by a special committee of the Chinese Cotton Mill Owners' Association to the farmers in the various cotton growing localities. A body of committees takes charge of all improvements concerning scientific cotton planting in China, and supervises the cotton experimental stations. The outlook for satisfactary results is very promising. The following figures give a rough estimation of the annual production of Chinese cotton:

Name of place.	Annual production in piculs. 1 Picul — 133⅓ pounds.
Shanghai and its neighborhood	1,200,000 piculs.
Nan Tungchow, Kiangsu	800,000 piculs.
Ninpo, Chekiang	500,000 piculs.
Hupeh Province	700,000 piculs.
Taitsang, Kiangsu	200,000 piculs.
Tientsin, Chihli	500,000 piculs.
Shansi Province	100,000 piculs.
Other places	1,000,000 piculs.

This makes a total of about 5,000,000 piculs or about 665,000 000 pounds or about 1,350,000 bales of 500 pounds each.

Efforts to cultivate cotton from American seed have been made by various individuals and organizations and satisfactory results have been obtained in many cases. The climate and soil along the Yangtze valley is claimed to be exceptionally well suited to the cotton plant. Mr H. Y. Moh, a Chinese cotton expert has stated that if certain methods are carefully observed, there is no reason why American cotton cannot be successfully grown in China, particularly in the Yangtze valley. However, there is a general curse that American cotton matures too late, usually about 50 per cent of the bolls are not cracked when frost sets in. To solve the difficulty the nearly matured bolls were picked a few days before frost set in and artificially dried, and the result obtained is but little inferior to cotton naturally dried. It is, then, a question of time to reach the desired end. When that time comes the Chinese cotton industry will have a new epoch.

The following table shows the amount and value of cotton imported into China during the past several years:

Year.	Amount	Value.
1911	39,676 piculs	905,738 taels.
1912	279,192 piculs	6,179,852 taels.
1913	134,735 piculs	3,017,318 taels.
1914	126,488 piculs	2,087,228 taels.
1915	357,821 piculs	6,619,390 taels.
1916	407,644 piculs	8,068,790 taels.
1917	300,128 piculs	6,406,314 taels.

The imported cotton may be either American or Indian cotton. Some of the best mills in China, particularly the Japanese mills in Shanghai which produce superior yarns, make it a practice to mix a certain amount of American cotton with the local staple, whenever the price of the former is low enough to make it advantageous. Some mills use American cotton to spin fine counts, such as 42s.

It is surprising to know that when a Chinese mill owner wishes to buy American cotton in Shanghai, he is compelled to buy it from a Japanese firm there, and the latter gets it from Japan. Where does the Japanese buy American cotton? Frequently he buys it from England and the latter in turn buys it from America. Why does not America handle this business with China direct? This question remains to be answered. China in the future may not import more American cotton due to the fact that the production of fine yarns is comparatively insignificant. Moreover, better methods of cultivation will doubtless result in an improvement in the quality of Chinese cotton.

The practice of watering cotton with from 20 per cent to 30 per cent of moisture has been the custom of many dishonest dealers in the past. It led to the establishment of a cotton testing house at the ports in 1901. Cotton was rejected if found to contain an excessive amount of moisture and the dealers making the sale were punished. In 1911 the Cotton Anti-Adulteration Association was established, under the rules of which the members agreed not to use any cotton which contained more than 15 per cent of moisture. Shanghai, however, has not in this respect reached the high level of the Tientsin market, where the standard of moisture is placed on a stricter basis than it is in Shanghai. In Tientsin no cotton containing more than 12 per cent of moisture is allowed to pass the barrier, while in Shanghai the standard is placed at 15 per cent. Numerous tests made by the testing-houses have shown that the adulteration by water has been greatly reduced.

One of the greatest needs in the raw cotton business in China is an association to determine classifications, there being no authority at present to determine how a raw product coming into the market is to be classified. It would undoubtedly be a great help towards making the deals in raw cotton in this market less risky, if a procedure somewhat similar to that in vogue in India were introduced. In India as soon as the new crop comes out, samples are brought into the offices of the Cotton Association and standard samples for classification purposes are determined upon. The Chinese mill owners are beginning to realize the need of such an association and are now working to perfect such an organization.

There are two large associations of cotton manufacturers in China which aim primarily at the improvement of the methods of manufacture in general. The older of these is the Cotton Mill Owners Association; of China which is composed of both Chinese and foreigners; and the other, the Chinese Mill Owners Association, is composed of the Chinese manufacturers only. The benefits which resulted from the establishment of these associations aroused wider and wider interest among cotton manufacturers and led to their expansion. It is impossible to measure the influence which these associations have had upon the development of the industry in past years, but it must have been by no means small.

Most Chinese mills, when started, employed foreign textile engineers for some length of time. Even today some prosperous mills are still employing foreign advisers or superintendents. The increase in the scale of operations and the keenness of competition placed a premium upon the competent overseer and superintendent, and where it is desired to improve the quality of the product a greater demand for well trained textile men arises. In order to meet the condition, Hon. Chang Chien founded the Nan Tung Textile College in 1912. The influence the school exerted upon the cotton industry in China cannot be overestimated. The Chinese mill owners are being stimulated by the foreign pressure, particularly the Japanese competion, to seek some way of safeguarding their position and are turning to textile education as one means of relief. Their efforts have resulted in passing a resolution last year authorizing the establishment of a textile school in Shanghai, the second school of its kind in China. Each mill will contribute a certain per cent of its annual expenditures, according to the number of piculs of cotton consumed per year.

Only the well-to-do Chinese can afford to learn textiles in schools; while the poor have little chance even to glimpse the inside of the buildings. In order to spread the textile knowledge among the workmen, a trade paper is contemplated. Japan has been publishing textile journals for years while in China no association or individual has ever

attempted to undertake this task. In order to remedy our short-sightedness in the past, Hon. Chang Chien has suggested that the publication of such a magazine be started at once. In accordance with this idea, the Nan Tung Textile College is undertaking the work. This is another progressive movement in the Chinese textile world.

Slowly and surely the Chinese mill owners are beginning to realize the necessity of having some means to uplift the standard of efficiency among their workers. Numerous methods, of course, are being practiced in many American mills but some of these cannot yet be applied to the Chinese industry for many reasons. Shanghai, the largest Chinese cotton manufacturing center at the present time, has done something along this line. The Yangtzepoo Club for the textile workers was established a few years ago under the leadership of Mr. C. C. Nieh, the manager of Heng Foong Cotton Mill. Some children workers are getting part time education from this club free of charge and men workers receive social enjoyment and various sorts of recreation. The club has proven very helpful and interesting to the workers.

The problems of efficient management have not been seriously considered by men in Chinese textile circles. A man who can read and write good Chinese and who understands ordinary mathematics is considered to fulfill all the requirements and qualifications of the Chinese industry. In most mills no officers can tell the cost of production or the methods necessary to reduce expenses. Some still believe the prosperity of a mill is due purely to luck, and that scientific and efficient methods have nothing to do with it. If anyone ever attempted to compare the methods of management between the Chinese and foreign mills, in nine times out of ten he would find that the Chinese plants are under the control and management of men possessing no managerial or technical knowledge. The Chinese mill owners must improve their methods of management or they will be behind the rest of the industrial world. It is evident that they are turning toward the first point. In most recently established mills, the men in charge are of a different type; they are men of world-wide knowledge in technical, commercial and economic points of view. Mr. H. Y. Moh, manager of Hou Sung and Teh Dah mills, and Mr. Chow, manager of Lou Fung Mill, are both returned American students. Therefore the future prosperity of the Chinese cotton industry seems quite promising.

The pay that Chinese labor receives is, perhaps, the lowest in the world. It should be remembered, however, that "cheap labor is dear labor." We have to consider the standard and efficiency of labor. Low pay depresses the workers' standard of living and consequently lowers their intelligence and character. Although American laborers receive more pay, as a rule they can do more work. The cost of living here is extremely low in many quarters. Oftentimes it has been found that it would be more profitable to use man power than machine power. The purchasing power of money is much higher in China than in many countries, and if a man gets 20 or 30 cents per day, he is no worse off than one who receives $5 or $6 per week in America. In the course of time the economic maladjustment will be modified. In economics we have learned that the efficiency of labor depends on two factors, namely, the efficiency of the workers themselves and the manner in which the labor force is organized and directed. Only economic and general educational advancement can remove the present faults. At present many mill owners are trying their best to increase the labor efficiency in their respective mills by various means.

Photo by Brown Bros.

TRANSPORTING CHINESE COTTON TO MARKET.

It seems almost incredible that the bonus system is universally recognized and maintained in every textile establishment in China, although it may not be effective or uniform. The Chinese cotton manufacturers employ the bonus system, the origin of which has to be traced in history and cannot be discussed here, as a means of reward to increase efficiency, but is not employed as an agent for industrial peace, for the Chinese workmen, as a whole, have no effective or well-organized union yet, and besides this, only the salaried men share the bonus and not the workmen. Other agencies for industrial peace, such as profit sharing, welfare arrangements, sliding scales, arbitration, etc., are not yet employed. Some mills, for example, the Dah Sung Mill, of Nan Tungchow, give as much as 20 per cent of their entire net profit as bonus. The manager and superintendent of the above mill have been receiving as much as from $8,000 to $10,000 per year when we include their regular salary and bonus.

Besides the bonus system, most Chinese mills provide

free board and lodging for their salaried men. Since the men get these two factors, which constitute the greater per cent of their daily expenditure, they can save nearly 90 per cent of their total income. Take an ordinary case. If a man in America receives $70 per month and spends, say, 50 per cent for board and lodging, he would really receive $35. If a Chinese should receive $20 per month, he would really receive $20 per month. According to the number of dollars, the former receives more and the latter less. But remember the purchasing power of money in China, in the comparison with that in America, is much greater. After all there is slight difference in this point between China and America, if one studies the fundamental law in economics. At present there are no mills in China providing houses for operatives as in many foreign countries. No cooperation has ever been tried, nor have cooperative stores ever been established.

"To get as much as you can out of your business" is too often heard in America. The same holds true in China. Whether in mercantile or in industrial pursuit, man always seeks for a thing which will enable him to make more profit. Unless there is a law instead of moral force which is not strong enough, to protect children and women working long hours in miserable conditions, mill owners are tempted to employ them as money making instruments. Here women and children offer themselves for employment because people are many and wages are cheap. Here there is no labor legislation for the restriction of the employment of women and children, no limitation as to the number of hours and conditions in which they work, etc. If any one goes to visit a cotton mill in China, especially at night, he will find many children probably under eight years in age, and women with their babies in baskets, working all night, from six p. m. until six a. m. next morning. A child receives, on the average, 10 cents per working day. This constitutes one of the greatest evils in cotton manufacturing in China at the present time. On account of foreign competitors in China, who pay little attention to the matter, many Chinese mill owners who try to remedy this defect will cause themselves financial loss. Shanghai, the greatest cotton manufacturing center in China, is an international port and hence it is not under the control of the Chinese government.

The following table gives the value in taels of yarn imported into China from different countries during the past few years:

Year.	British	Indian	Japanese	Other countries	Total
1912	464,709	35,762,958	23,756,746	4,967,721	61,445,593
1913	219,004	36,397,346	32,550,897	512,191	71,060,089
1914	201,733	29,702,950	37,575,662	1,842,350	69,985,616
1915	15,813	28,793,715	36,455,627	2,505,271	67,107,523
1916	.....	25,638,517	34,023,383	1,892,842	60,164,091
1917	1,863	29,068,944	30,556,278	1,461,180	60,141,806

It is readily seen that the imports from Japan amount to over 50 per cent of the total. India comes next. Certainly Japan will continue to export more textile goods into China in the future. Although China has at present more than a million and a half spindles in operation, still she needs a great deal more to supply her own needs. Yarns spun in China are mostly from 10s to 20s and sometimes 42s, the latter being spun from American cotton. Only coarse gray sheetings are being produced in mills in China, the higher quality cloth being imported. There is a great field for American textile men to investigate in the market conditions of these lines of goods and organizing of an export method to meet such a demand.

A story of the cotton manufacturing industry would not be complete without the mention of the knitting industry. The latter industry has been developed during the last twenty years. It made its appearance first in Hong Kong and then gradually spread to Shanghai. The total number of knitting machines in China at present is over 1,000, besides the hand knitting machines made by the Japanese. The makes used are Banners, Scott and Williams, and Brintons, each of which has an agent either in Hong Kong or in Shanghai. Nearly all the product of the knitted goods is consumed at home but a small quantity is being exported to Manila, Calcutta, Singapore, etc. There are numerous small knitting factories consisting of a few Japanese made machines scattered all over China. The cost of that kind of machine is about $40. It is claimed that each machine of this kind can produce about two dozen half-hose per one working day of 12 hours.

Up to the present time there are 1,500,000 spindles and about 9,000 plain looms in operation in China, over 10 per cent of which are of American make, and the rest are of English manufacture. Fortunately nearly all knitting machinery has been imported from America. The marked success of the mills under foreign management in Shanghai in the past years has proved that China offers a splendid field for the development of cotton manufacturing. The British and Japanese are already here. Will Americans follow suit? The demand for imported high grade sheetings, grey sheetings, drills, jeans, and piece goods of high quality is enormously great in China. Why should the American textile manufacturers not study this market more seriously and ascertain the exact kind of goods which can be made in the United States and profitably sold in China? Remember there are three important lines of trade in which Americans should be interested, namely, textile machinery, cotton piece goods and the establishment of cotton mills in China.

The present Chinese boycott on all Japanese articles has again roused an interest in the possibilities of the sale of American cotton goods in China. Although this movement may not last very long, this spirit toward Japan will be germinated like mustard seed as time goes on. Before the war Great Britain easily led the world in the sale of this material in China, but because of shipping difficulties and other reasons caused by the war, England's opportunities have been greatly hampered and Japan has been able to make great inroads into this business. The recent decision of the English manufacturers of cotton goods to send a commission to China for the purpose of investigating the market for British piece goods in China shows the importance which that country places on the Chinese market. In view of the awakened interest on the part of American dealers in this merchandise, the following article, by Julean Arnold, American Commercial Attache, printed recently in the U. S. Commerce Reports is apropos:

"Chinese cotton experts state that the demand for American cotton goods will advance in the post war period only if American manufacturers adopt fundamental changes in their methods of dealing with Chinese wholesale dealers. The stocks now held by dealers here are but a fractional part of the amount ordinarily held in the trade here. The falling off in the sales of American cotton goods is due mainly to the keen competition on the part of the Japanese manufacturers, who have gradually absorbed the business of American cotton goods in China. Secondly, American agents have subjected the Chinese dealers to too keen competition among themselves by selling the same brands of goods to many firms. In the case of English agents the sale of one chop or brand is confined to one dealer, so that there are no two agents in the country selling similar brands of cloth. This procedure is best adapted to the market, for it has enabled many Chinese capitalists to push the sale of English cloth, since they are sure to get buyers in the interior at their own prices. In the past the foreign houses in China handling American cloths did their best to give the native distributors the necessary encouragement by confining certain mill brands to certain dealers, but in this they were not supported by the mills and their agents in America, who would sell the same brands to any buyer. This made competition so keen that practically every distributor of American cloth lost money on purchases made. Further, American agents may find it very difficult to compete successfully against the Japanese, who are able, by the establishment of local plants, to produce low priced goods and to follow the market. These Japanese mills use 20 per cent American cotton and 80 per cent Chinese and Indian cotton, thus being dependent upon the price of American and Indian cotton. Chinese buyers, however, are beginning to appreciate the superiority of the quality of American cotton goods and are looking to the wearing qualities in making their purchases. This is especially true in Manchuria, and lends hope to the possibility of the resumption of an American cotton goods trade in that market which formerly took millions of dollars worth of American cottons.

"There are only 300 bales of American grey shirtings in pieces of 12 pounds in the market as this is written; or of drills in 12 to 14 pounds, or jeans of 8½ to 11 pounds. There are ample stocks of all these cloths in the hands of Japanese dealers, except the 14 pound gray shirting which they cannot make. Some of the retail stores have in stock American cloths of many descriptions, but only for special customers. The difference in the cost between American and Japanese cloth is between one and two taels per piece. When shipping opportunities become more favorable and freights to the Orient lower, it will still be possible to import American piece goods into China provided the prices are kept within the limit of competitive sales. American cloths are of excellent quality and liked by the Chinese, but the Chinese merchants are now compelled to deal in Japanese goods because they cannot get American goods at the price required by the majority of their customers. The American manufacturers, so the Chinese dealers state, would profit by following the British methods of confining the sales of certain brands to certain dealers. Good opportunities await American capitalists who are willing to operate cotton mills in China and produce the brand of goods to suit the local market at competing prices."

Western Electric Portable Utility Light.

A new type of night light for highly localized lighting has recently been placed on the market by the Western Electric Company. This light, which is known as the Western Electric portable utility light, is for use at close ranges where the light is to be located at a distance not greater than 125 feet from the object or surface to be illuminated.

With the light operating on a 100 foot throw, a 100 foot spread is obtained at an angle of sixty degrees. The unit gives a smooth white light without gleam or glare. This is made possible by a new development—the hammered glass reflector. A 200-watt Mazda, Type C, lamp is used.

The hammered glass reflector is spring suspended in a one piece cast iron housing. The housing is closed by a wire glass front which is fitted into a recessed cast iron ring. This forms a door which is hinged at the bottom and secured by a hand latch, thus affording easy access to the interior of the housing. The recessing in the ring makes the interior of the housing fully weather-proof.

The lighting unit is furnished in either a black or gray weather-proof enamel finish. It is 19¼ inches high and weighs approximately 30 pounds. This light weight makes the unit very easy to carry from place to place. The base is 9 inches in diameter, giving the light stability when mounted on a flat horizontal surface. The unit can also be mounted on either vertical or flat surfaces such as walls, poles or roofs, by virtue of a heavy universal joint which fastens the housing to the base.

The light has a wide range of applications. In railroad work it can be used for lighting transfer tables, coaling stations, inspection pits, loading platforms, cranes, roundhouses and drawbridges. On marine work it can be used for lighting docks, dredges, slips, loading operations, canal locks, dry docks and pile drivers. Its industrial applications cover even a wider variety of uses such as lighting shop yards, material yards, coal yards, well drilling, coal tipples, erecting shops, machine shops, tramways and inclines, conveyors and all kinds of emergency work. Other uses will be found in illuminating play grounds, skating rinks, signs, street corners, alleyways, swimming pools, monuments, flags, building fronts and construction work in general.

Motion Picture Machines for Cotton Mills.

The Lucas Theatre Supply Company with headquarters in Atlanta, Georgia, and a branch at Dallas, Texas, announces that they are equipping such a large amount of cotton mills and other industrial plants with complete moving picture equipment, as to necessitate the installation of a new department, which is devoted exclusively to this particular branch of their business. It is in charge of a projection engineer of many years' experience, and those contemplating installing motion pictures at their plants should feel free in consulting this well-known concern. The Lucas Theatre Supply Company recently installed a complete projection apparatus in the recreation hall of the Fulton Bag & Cotton Mills of Atlanta, consisting of a special Simplex Mazda Equipment with screen, etc.

The Manufacture of Domets

BY WILLIAM B. NANSON.

The Organization of the Fabric.

As I have previously stated, the successful finishing operations necessary to produce a firm close finish upon a piece of cotton domet are entirely governed by and dependent on the construction of the body of the cloth and if this is not built up as it should be, the finish will be inferior.

Domets or "flannelettes" can be divided into two different classes—the lower grades which will stand napping only on one side, and the better makes, both sides of which are napped. In the first group, the warp is usually shown alone on the right side, while the filling is thrown on the back, but in the goods to be napped on both sides both warp and filling appear in nearly equal proportions, varying, of course, with the weave. In this latter class of goods, the warp will also require the taking on of some nap and should not, therefore, be made from yarn too tightly spun, but should be loose enough in twist to yield some nap, and at the same time be made from cotton long enough in the staple to keep the strength of the fabric.

Napping machines have been brought to such a high state of efficiency that it is difficult to tell a well napped flannelette of good quality from a fine woolen if the construction of the cloth is right and the napping and finishing have been conducted properly.

After napping it is a rare thing that the cloth can be allowed to go without a sizing to impart some stiffness and body to the goods, because cotton cloths are usually sleazy without it after napping. This applies especially to domets, but not to napped dress goods.

The dressing applied to napped goods where the napping is done on both sides should be well squeezed into the body of the cloth by heavy rollers, using for this purpose a mangle with rubber-covered rollers and a heavy pressure so that there is a minimum of dressing left on the nap.

Low grade flannelettes used usually for linings are napped on one side only and must be napped lightly a number of times so as to get an even and uniform nap, free from streaks, fraying and other damages. These goods are then filled heavily on the back, or unnapped, side only and china clay or other fillings may be used. This is applied on a back filling machine, or in some cases a Tommy Dodd mangle may be used. These, and in fact all napped goods that are starched after napping, must be dried on the tenter and the nap raised again on the napping machine, then damped or conditioned and heavily calendered. Many finishers, when dealing with goods napped on only one side, give the other side a passage over the emery machine, which is fitted with rollers covered with emery paper only. The object of this is to slightly abrase the surface, giving in fact a very gentle napping action which makes the cloth handle much fuller and more clothy. Starching on the back now follows, after which the goods are dried on the tentering machine so as to keep the width out and the nap as free and unmatted as possible, as drying on the ordinary steam cans would flatten the nap and make the second raising more difficult.

The commonest style of domet is usually made from about 1476 ends of 18s warp on a 22 reed and with 42 picks of 15s filling. These should finish about 27 inches wide and weigh about 5 yards to the pound, though this width and weight will be governed somewhat by local conditions. This style of organization is especially desirable where the goods are to be cross-checked in the pattern. A very nice domet especially adapted to stripes is one made from 1476 ends of 22s yarn, 24 reed, and 48 picks of 15s yarn. This will also weigh about 5 yards to the pound when finished.

Another good style is 1520 ends of 22s warp, 24 reed, 42 picks of 12s filling. These are shaker flannels and must be woven with a tape selvage of 10 threads of No. 15s light blue yarn on each selvage. This selvage should be drawn double like a flat thread duck.

These goods may be woven into either checks or stripes and we give herewith examples of a few of the more popular patterns:—Pattern No. 1:Warp—2 blue; 2 white; 2 blue; 4 white; 2 black; 2 white; 2 black; 1 white; 1 red; 1 white. Filling—8 black cadet; 8 brown cadet; 2 red; 8 brown cadet. Pattern No. 2: All white. Pattern No. 3: All black or brown cadet. Pattern No. 4: Warp—4 red; 8 blue; 8 red; 36 blue; 12 gold; 4 red; 8 gold; 8 red; 24 gold; 24 blue. Filling—all blue. Pattern No. 5: Same as warp. Pattern No. 6: 4 royal blue; 8 drab; 8 royal blue; 8 seal brown; 8 royal blue; 32 seal brown.

The advantage of designing patterns that can be filled in both solid color and check is obvious where the mill has both plain and box looms, especially where automatic looms are concerned.

The brown and black cadet called for can be made, for the cheaper grade of goods, by putting up a strand of brown (or black) and a strand of white from the slubber onto the intermediate and drawing them together into 1-25 to 1-60 roving and then spinning single into 12s to 16s filling. For the better grades, however, a very different mode of procedure must be carried out. In the first place a standard grey and a standard brown must be made in the picker room on the finished lapper or in some reliable manner that can be standardized; this brown or grey is made by mixing one lap of black or brown with three laps of white. This is carded in the usual manner, (as described) and split into four slivers on the card and run into four coiler cans. These are run through the slubber and the intermediate and if necessary through a finer frame as we need 3.50 or 3.25 hank roving from this. For the brown cadet we shall need a 3.25-3.50 roving made of half white and half grey from the intermediate frame. This makes a 3.25 hank brown and a grey mock twist. This in turn is put on the spinning frame with a bobbin of solid standard brown, and the two bobbins are drawn and spun together into a 15s or coarser yarn. For the black cadet we put on the spinning frame one bobbin of black and white mock twist from the roving frame and one bobbin of solid standard grey, both 3.25-3.50 hank, and draw and spin together as for the brown; other combinations of colors are of course possible.

I would say here, in passing, that black and white cadet (mock twist) for cottonades is different, and should be

made from 1 hank black and 3.25 hank white put up and spun together on the spinning frame.

I would also reiterate the warning previously given, that any change in twist will materially alter the appearances or shade of *any* of these cadet mixtures and care must be taken to avoid this.

In all places in the above where I speak of a slubber, I mean, of course, the intermediate fitted with the slubber take-up rolls and running the sliver direct from the card. There is another style of domet which the writer has made and which he styled "baby cloths" as they were designed for children's wear, more especially for night gowns. They were made from 1392 ends of 25s yarn for the warp. This yarn is all white with the exception of a tape selvage of about 10 or 12 ends of No. 15s blue or pink. These goods were filled in three different ways—brown cadet and black cadet made as described, and white. These goods were

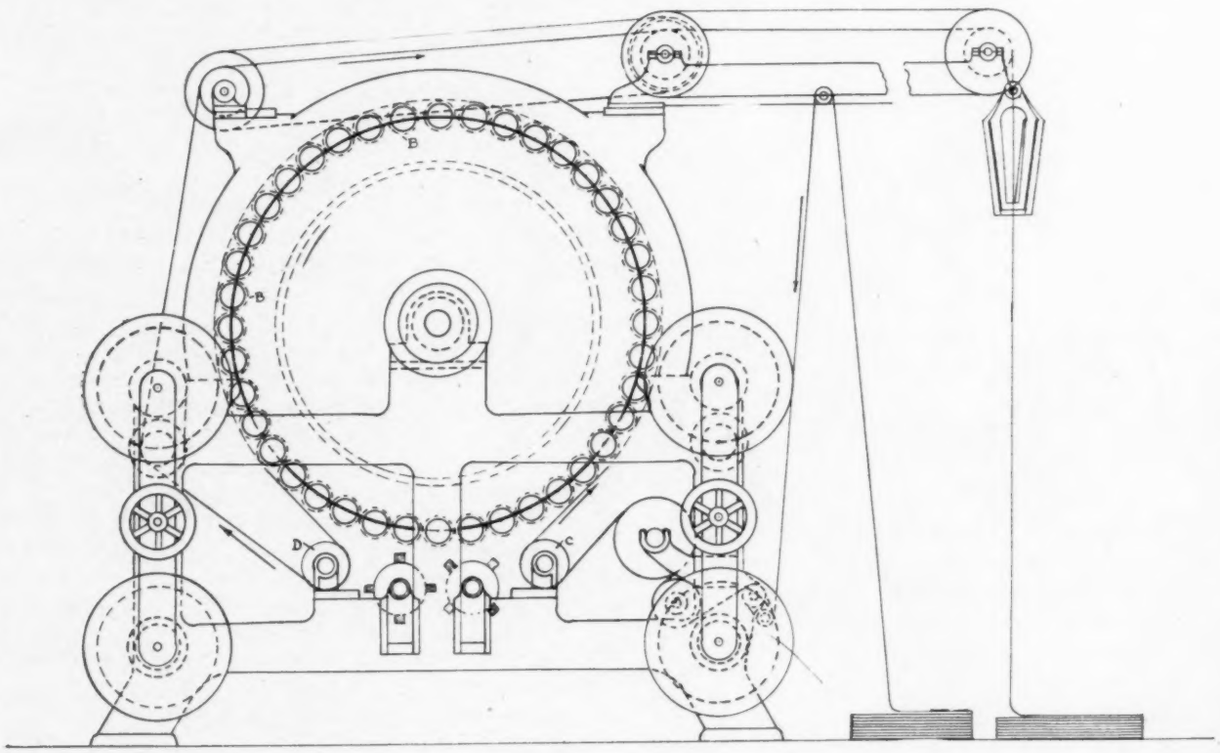


FIG. 1

woven on a 24 reed, 48 picks of 15s filling and weighed about 4¾ yards to the pound.

I also made a "baby cloth" which I bleached, and which certainly was a beautiful piece of goods. This was made of 1456 ends of 25s yarn, 24 reed, 48 picks of 12.30s filling and finished 4.75 yards. These bleached goods had a delicate blue selvage and were well blued after bleaching. They were bleached soft by the caustic soda and hypochlorite of soda process, no lime or "antichlor" being allowed near them. These goods sold well, the bleached ones and those filled with the black cadet selling the best.

A good strong line of napped dress goods can be made from 16s yarn, 48 x 42 picks. This naps good and makes a nice line of plaid, of, for example, the following plaid in various varieties of colors: Warp—60 wine color (mahogany); 4 white; 4 black; 18 white; 4 black; 4 white; 4 black; 18 white; 4 black; 4 white. Filling same.

Finishing.

The finishing, of course, is the most important process in the manufacture of domets and other napped goods and it may be rightly said that the finish is the main factor controlling the sale of the goods.

In former times, when cotton was cheap, there was no need of giving "feel" and weight by outside means. As things are now, however, it is necessary to make light goods imitate heavy ones in handle, as well as in weight, and this is the finisher's task.

The first class flannelette, or domet, of a few years ago, before the great rise in cotton, has now almost entirely disappeared from the market and has given place to fabrics of inferior quality. By making these inferior goods manufacturers have been able to meet the increased cost of labor and raw material by charging only a little more for the second rate products than they had previously demanded for the better class goods, and by improved methods of finishing. Customers are not willing to pay the advanced price for the first class goods but they demand the soft feel of the old prime quality and the only way out of the difficulty lies in giving a suitable dressing to the goods.

The finishing consists of a good, but not too severe napping on a napping machine with from 24 to 36 napping rollers. The goods must go through this at least twice on each side in the following order: 1st, face; 2nd and 3rd, back; 4th, face. This is important. The more gentle the napping—that is to say the larger the number of runs required (in reason) to achieve a given result—the better, i. e. the closer and thicker the nap. After napping the goods must be starched with the following mixture:

Wheat starch	12 pounds
Glauber salt	16 pounds
Potato starch	8 pounds
Irish moss	4 pounds
Turkey red oil	2 pounds
Water	80 gallons

The moss is soaked in water for 12 hours, then boiled

for two hours and added to the other ingredients through a fine sieve. The goods are then dried on the tentering machine and allowed to lie until quite cold. They are then napped again, once on each side, to raise the flattened nap. In this way we get a quality of goods which even experts can hardly tell by handle from first class all cotton goods.

All the goods which we have mentioned are napped on both sides while being finished, but there are styles of woven colored goods made from fiber dyed cotton that are napped on one side only—for instance, some styles of coat linings. After napping twice on the face, these goods are heavily calendered to close the interstices between the threads. They are then starched on the back by means of a cloth-covered starch mangle or a back filling machine, and dried on the cans. If the goods are of a thin, low texture, requiring a lot of stiffening, the starch mixture may consist of the following:

Dextrine	75 pounds
Glauber salt	20 pounds
Soaked glue	20 pounds
Wheat starch	5 pounds

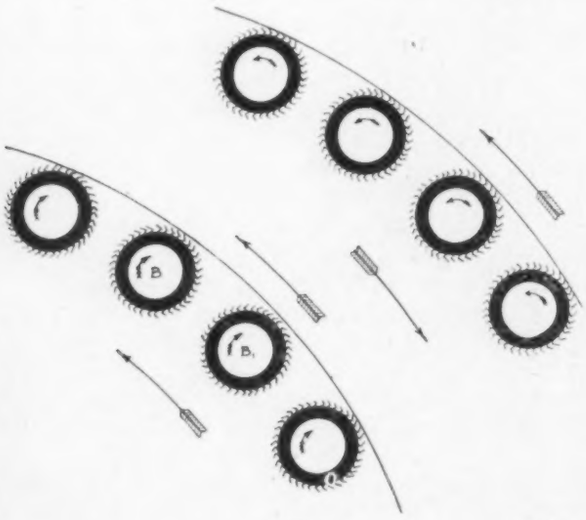


FIG. 2 FIG. 3

Turkey red oil	5 pounds
Magnesium chloride liquor	30 pounds

These ingredients are dissolved in 30 gallons of water. Add first the magnesium salt, then the starch (first made into a paste with cold water), then the glue, and then the dextrine. Turn on the steam and heat up until all are dissolved. Turn off the steam and add the glauber salt and the turkey red oil and boil for a few minutes. Make the whole up so as to stand at 15 degrees Baume, at 50 degrees Centigrade, by adding water if necessary. Linings raised on one side in a plain weave are usually of an inferior quality and must be heavily starched on the back with a dressing no weaker than 14 degrees Baume. Twills of even the same fabric are better and the starch dressing can be diluted to 12 degrees Baume. For good thick linings starch dressing of 8 to 10 degrees Baume may be sufficiently strong. The dressed goods are then dried, napped lightly again to freshen up the nap, then conditioned or steamed, and calendered, or better still, hot pressed.

Linings napped on both sides are starched with a softer dressing, as it is desirable to produce a wooly, and not too stiff a finish. Therefore, in the foregoing recipe, the starch is omitted and the quantity of turkey red oil is increased. The 5 pounds of starch may be replaced by the same weight of red oil. The processes are exactly the same. The strength of the dressing varies from 5 to 10 degrees Baume according to the quality of the goods. The dressed goods must be again raised (napped) and calendeler as before. They will then have a wool feel and appearance. Goods napped on both sides must be run overhead into the starch, i. e., run through it and it may be well to leave the glue out.

The magnesium liquor mentioned in the recipe is made by boiling up 20 pounds of potato starch, 40 pounds of crystallized magnesium chloride and 2 pounds of salammoniac in 30 gallons of water.

A specialty among the better class coat linings consists of the "Atlas" lining, which shows colored patterns on a white or uni-colored ground. The pattern is usually made with silk or mercerized cotton threads. The goods have a twill or a diagonal weave. The peculiarity of these goods is the fact that they are napped twice on the back or wrong side, heavily calendered; starched on the *napped* side and dried. A good dressing for these goods is made as follows:

White dextrine	75 pounds
Glauber salt	20 pounds
Turkey red oil	15 pounds

These quantities are boiled up with water to about 30 gallons and the finished dressing should stand at 13 to 14 degrees Baume. This must be diluted with water before using to 5 degrees Baume. The goods are then dried, renapped, calendered and given a subdued luster (or silesia finish) by hot pressing. Another and more recent style of dressing for these linings and another style of napped fabric is to use a starch made soluble with diastofor. The mode of procedure may be as follows: Boil up 45 pounds of corn starch in the usual way, then cool it down to about 150 degrees Fahrenheit and add one or two pounds of diastofor previously dissolved in lukewarm water. The paste soon becomes liquid and transparent. As soon as the desired consistency is obtained, the action of the diastofor is arrested by momentarily boiling or by the addition of a little soda. This may be used alone for some finishes, or the necessary thickening, weighting, or softening materials may be added to it to obtain any result desired.

Starch made soluble with diastofor is a most valuable dressing for napped goods and any desired result may be obtained with it. A homogeneous paste is first prepared by mixing the starch with cold water and boiling it, with constant stirring, until it thickens. It is then cooled to about 150 degrees Fahrenheit, using cold water, if necessary but in the writer's opinion, compressed air is better for both stirring the starch and cooling it off after boiling. After cooling, diastofor, previously dissolved in lukewarm water, is added, using from 8 to 12 ounces of diastofor to every 25 pounds of starch used in the mixing. This is also well stirred in. The action of the diastofor must not be prolonged beyond the point when the paste becomes thin and transparent, which will take about half an hour. It is necessary to stir constantly during this time so that no deposit is formed and that the solution is thorough throughout the mass. The action is then stopped by bringing the mixture to a boil and all other ingredients are added at this stage of the game.

Starch so converted is valuable for the preparation of supple and closely adherent finishes and is a highly satis-

(*Continued on page* 117.)

Designs for Fancy Cotton Fabrics

BY T. WOODHOUSE AND J. IRELAND.

PART FORTY-SIX.

The fabric illustrated in Fig. 210 is an example of warp spotting on a pique ground. Two different counts are again used for the warp—one for the face and one for the ground. There are also two different counts for the filling; the face filling is practically the same count as the face threads, but the back filling is a coarser yarn, i. e.,

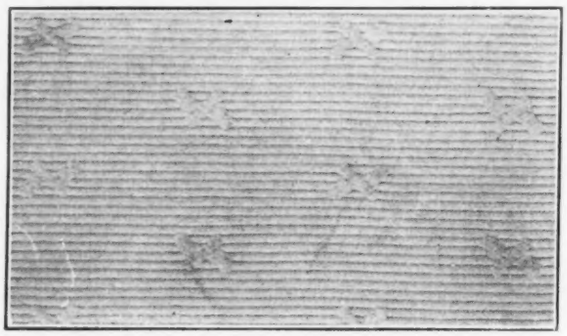


FIG. 210.

a lower count than that used for the face. All the yarns are white, and the arrangement is as follows:

Warp: One thread fine yarn for face cloth; one thread medium yarn for ground cloth; one thread fine yarn for face cloth; or equivalent to two threads of face to one of ground.

Filling: One pick fine yarn for face cloth; one pick coarse yarn for ground cloth; one pick fine yarn for face cloth. This continues for two repeats; then come two picks fine yarn for face cloth, or, altogether, six picks of face yarn to two picks of ground yarn per repeat.

The raised warp spots which form so prominent a feature of this cloth are square in shape and are obtained by floating nine of the face threads over all the picks of the filling at the particular points desired. These spots are distributed over the face of the surface of the cloth in the well-known "diamond," "drop" or plain-weave order. Except at these particular places all the face threads and picks interweave with each other in 1 up 1 down plain order. This is shown by the crosses in the sectional design P, Fig. 211. The actual and complete design would occupy too much space but sufficient is exhibited to explain the structure in conjunction with the diagrammatic sketch in Fig. 212.

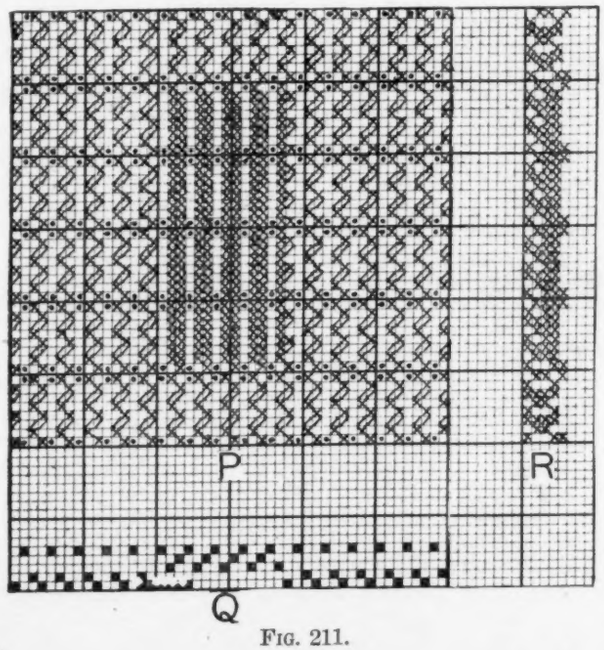


FIG. 211.

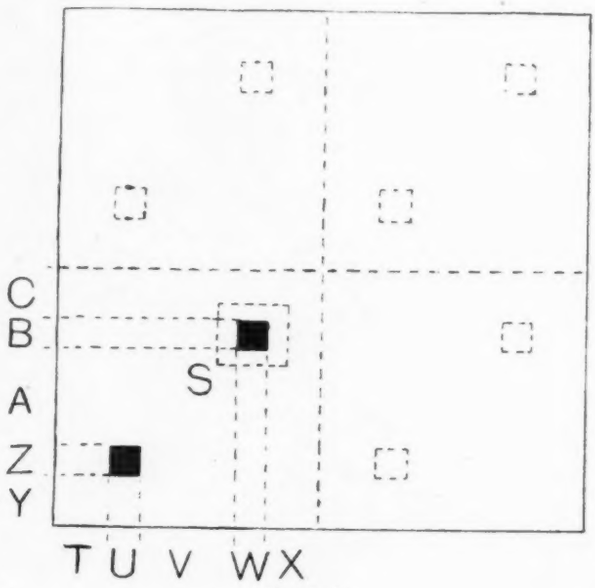


FIG. 212.

In this sketch there are four repeats of the pattern, the unit being shown in solids in the bottom left hand corner. The dotted rectangle S represents that portion of the repeat which has been selected for, and carried out in, the design P, Fig. 211. In the full unit of the design there are 80 face threads and 40 ground threads made up as follows with regard to Fig. 212: 24 threads for portion T; 13 threads for spot U; 47 threads for portion V; 13 threads for spot W: 23 threads for portion X.

In the filling there are 156 face picks in one repeat of the pattern and 52 ground picks in one repeat of the pattern. These are apportioned as follows, again with reference to Fig. 212: 36 picks for portion Y; 32 picks for spot Z; 72 picks for portion A; 32 picks for spot B; and 36 picks for portion C.

Since only part of the design is given at P, Fig. 211, it follows that the draft at Q is not complete; it represents only the draft for those threads represented in the design P. It will be obvious, however, that all those portions marked T, V and X, Fig. 212, of which the first 16 threads and the last 16 threads of the design P form a part, will be drawn through the same three harnesses and in the same order as are those two groups of 16 threads, i. e., the order of drafting will be 1, 5, 2 with the necessary number of repeats of this order.

It will be noticed that all the ground threads, including those parts where the figured spots appear, are weav-

ing alike, and therefore all the ground threads can be operated by one harness, or if the number of threads per inch were excessive, by two harnesses both of which could be tied together to work as one. In the draft Q, Fig. 211, these threads appear on the 5th harness.

The nine threads which float to form the warp spots in the centre design P have been placed on harnesses 3 and 4, but it will be evident that since the next spot to the left or right in Fig. 210 is not in the same horizontal plane as the one illustrated, two other harnesses would be necessary to operate the threads for this second spot, and the threads would be drawn through the eyes of these extra two harnesses in a similar manner to that illustrated on harnesses 3 and 4 in the centre of the draft Q. The complete draft would therefore require 7 harnesses, and for this complete

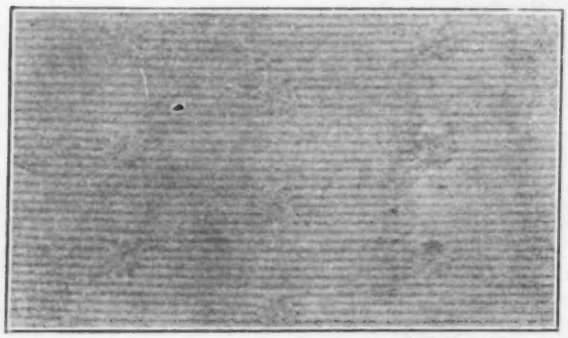


FIG. 213.

draft it would be advisable to place all the ground threads on the back harness, i. e., No. 7. In the draft Q, the ground threads are shown on the back harness of the five, but the introduction of the extra two harnesses for the second spot would clearly change the ground threads from the 5th harness to the 7th harness of the complete set if, of course, the spot threads occupy harnesses 5 and 6. The weaving plan of R, Fig. 211, is for that portion only produced at P. In the finished cloth there are 100 threads per inch for face and 50 threads per inch for ground, which is equal to 150 per inch; while in the filling there are 210 picks per inch for face and 70 picks per inch for ground, which is equal to 280 per inch.

The structure of the cloth illustrated in Fig. 213 is very similar to that in Fig. 210 in that it is a pique cloth with spots distributed over the surface in diamond order. There are differences, however, in detail, and our remarks will be confined mostly to these differences. The warping order is again one thread for face, one thread for ground, and one thread for face, or equal to two of face to one of ground.

The order of the filling is one pick for face and one pick for ground for 8 picks and then two picks for face which is equivalent to six picks of face to four picks of ground.

The yarns are all bleached white; the face warp and filling are of practically the same count, the ground warp is slightly heavier or lower in count, while the ground filling is heavier still. The ground filling is introduced into the cloth in double picks, that is, two filling picks run together as one, technically termed "double filling." These latter picks float on the surface at the necessary intervals to form the small elliptical figures.

From what has been said previously in regard to the cloth illustrated in Fig. 210 and the design and sketch in Figs. 211 and 212, it will be unnecessary to supply the full design for this cloth. We have selected a portion which embraces one of the elliptical figures as well as a few of the surrounding threads and picks, and the design for this section is shown in Fig. 214. The different marks in the design signify the following: Crosses represent the face threads and picks interweaving in plain order throughout; dots represent the ground threads which all weave alike and therefore can be controlled by one harness. Diagonals represent the face threads lifted on the ground picks. The heavier crosses and diagonals are introduced solely to make the outline of the figure a little more distinct than would otherwise happen.

In those places where the ground picks are brought to the surface to form the elliptical figures, the face threads have to be dropped, and therefore, the diagonal marks are omitted on these picks in these particular areas. Running through the centre of the elliptical figure is a vein or twill,

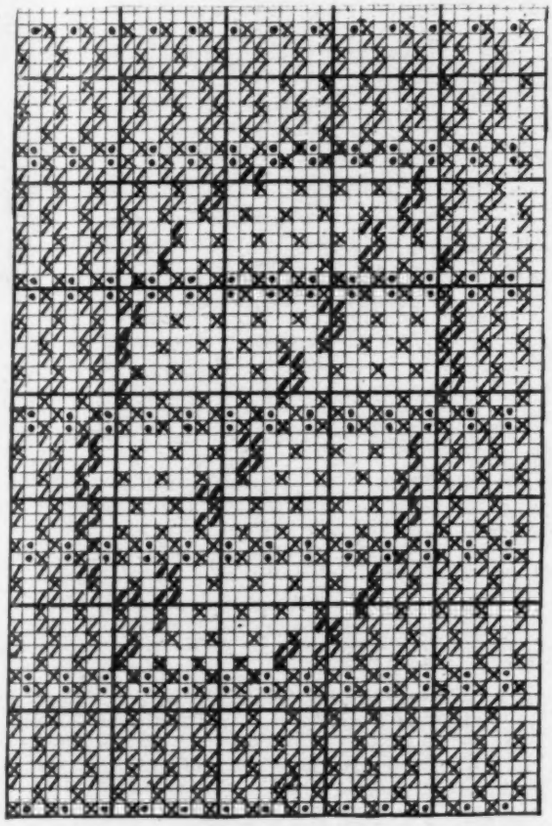


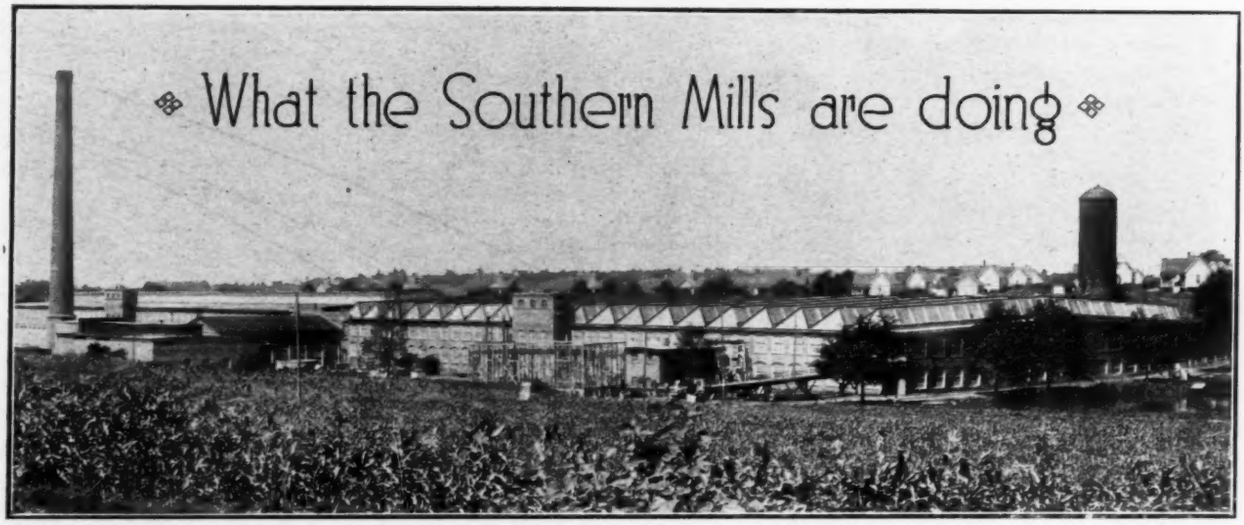
FIG. 214.

and this is obtained by raising the face threads as indicated in Fig. 214. This vein serves a double purpose—it enhances the figure and prevents excessive floats of the filling. The vein in each case runs along the major axis of the ellipse.

Although the order of the distribution of the spots is identical with that in Figs. 210 and 212, a considerably larger number of harnesses is required for the present example than for the one in Fig. 210. In the latter case, 7 harnesses were sufficient, but for the complete design in Fig. 213, and of which Fig. 214 is only a part, it would be necessary to employ 35 harnesses. Of these, 16 harnesses would be utilized for each of the two vertical rows of ellipses, or 32 harnesses for the figured portion, 2 har-

(*Continued on page* 113.)

What the Southern Mills are doing



THE BROCON MILLS, ANDERSON, S. C.

The property of the McComb Cotton Mills, McComb, Miss., was purchased recently by Alvin Hunsicker, who is president of the Mobile Cotton Mills, and vice-president of the Standard Textile Products Company, which owns the Meritas Mills, Columbus, Ga. J. T. Broadbent, agent of the Meritas Mills and Mobile Cotton Mills, will have charge of the general management of the plant. C. K. Taylor has been appointed general superintendent and local manager. Mr. Broadbent was in charge of the Mississippi Textile School at the Mississippi A. & M. College, Starkville, Miss., some time ago. The mill property of the McComb Mills is now being placed in operation and 350 Draper looms are being installed.

The directors of the Dan River & Riverside Cotton Mills, Danville, Va., have made announcement of the authorization of enlargements and improvements to the Riverside mill group, the cost of which will be two and a half million dollars. The improvements will include the erections of a modern concrete mill building, 700 x 140 feet, three stories high, and the installation of from 2,500 to 5,000 additional looms.

The Ware Shoals (S. C.) Manufacturing Company will build a new school building, to be two stories high, electric-lighted, and with modern equipment throughout.

The Johnston Mills Company have opened offices in the Piedmont Building, Charlotte, N. C. The main offices of this company are in New York and Philadelphia. The company acts as selling agent for a number of cotton mills.

The capital stock of the Santee Mills, Orangeburg, S. C., has been increased from $225,000 to $450,000.

The Elizabeth City (N. C.) Cotton Mills are building a new warehouse. All the houses in the mill village have been painted and improved.

The capital stock of the Toxaway Mills, Anderson, S. C., has been increased to $500,000.

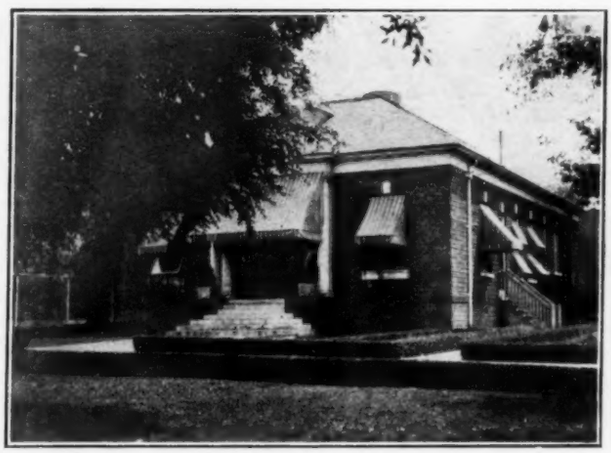
Ten new houses of the bungalow type have been erected in the mill village of the Jackson Mills, Iva, S. C.

Orders have been placed by the White Oak Cotton Mills, Greensboro, N. C., for 1,000 Draper looms, to be installed at their plant, at which denims are manufactured. This will make the total number of looms at this plant reach 3,000, as there are 2,000 looms already in operation. The present building of this mill will be enlarged to provide for the additional looms. It is reported the owners contemplate spending $500,000 on improvements within the next few months.

The Tolar, Hart & Holt Mills, Fayetteville, N. C., recently amended their charter by increasing the capital stock of the company from $207,000 to $414,000.

The Vance Cotton Mills, Salisbury, N. C., are to be greatly enlarged soon. At a recent meeting of the stockholders, it was voted to increase the authorized common capital stock of the company from $131,000 to $200,000. It is also proposed to enlarge the mills and install 5,000 new spindles.

The Brison Manufacturing Company, Gastonia, N. C., has been chartered with a capital of $200,000, for the manufacture of yarns, etc. R. Hope Brison and others are the incorporators.



A VIEW OF THE OFFICE AT THE EXPOSITION COTTON MILLS, ATLANTA.

The Superior Yarn Mills, Statesville, N. C., have been incorporated with an authorized capital of $800,000, to manufacture yarn and cloth, by J. B. Hall, of Belmont, N. C., and others.

The Princeton Cotton Mills and the Marsh Cotton Mills, Salisbury, N. C., will be merged into one corporation, according to an announcement made recently by T. B. Marsh. The mills are controlled by Mr. Marsh, Frank Murdock and T. B. Marsh, Jr. An increase in the capital stock to

double the present amount will be made as soon as the details of the consolidation are completed. The two plants contain about 50,000 spindles and both manufacture damask.

A contract has been let to the West Point Iron Works for 150 bungalow type operatives' houses for the new mill village of the Bibb Manufacturing Co., Columbus, Ga. The village is to be equipped with electric lights, waterworks, sewerage, etc. The engineering work will be handled by Robert & Co., engineers, Atlanta, Ga.

The Arcadia (S. C.) Cotton Mills are planning the electric lighting of their entire village, both streets and houses. The designing is being done in the office of J. E. Sirrine, Greenville, S. C.

The Cowpens (S. C.) Manufacturing Company has been sold by J. W. Brown and associates to Hiram W. Kirby, of Spartanburg, S. C., and James P. Gossett, of Williamston, S. C. Mr. Kirby, who is also president of the Star

STEPS OF CONCRETE THAT WILL ENDURE THE WEAR IS THE KIND USED AT THE ORR COTTON MILLS, ANDERSON, S. C.

Knitting Mill, Spartanburg, S. C., was elected president and treasurer of the newly acquired company, succeeding Mr. Brown.

The Fairfax (Ala.) Mills are building an extension to their bleachery. The building will be 163 x 75 feet, of reinforced concrete and standard mill construction. The equipment will be electrically driven. Construction has already begun.

The Anniston (Ala.) Manufacturing Company is arranging to change its equipment of 13,000 spindles and 350 looms to electric drive. The work is being designed by J. E. Sirrine, Greenville, S. C.

The Elizabeth City (N. C.) Cotton Mills will equip the houses of their mill village with Kaustine toilets.

Plans have been drawn by Lockwood, Greene & Co., of Boston and Atlanta, for the construction of a large addition to the plant of the Columbus (Ga.) Manufacturing Co. It is stated the plans call for the construction of a four-story annex near the same size of the present mill. The company also plans to construct a number of cottages for employees as a nucleus to the establishment of a new mill village in that section.

Plans and specifications have been completed for a new cotton duck mill at Waxahachie, Texas, by J. O. Chapman and E. A. DuBose. The mill is to be modern in every respect, being equipped with electric drive, automatic conveyors, etc. The contract for the construction of the mill building, warehouse and mill village will be let in the near future. Robert & Co., engineers, Atlanta, Ga., prepared the plans.

The Ernaldson Cotton Mills Company has been incorporated at Raleigh, N. C., with a capital stock of $300,000. The incorporators are R. McEachern, W. D. Johnson and R. C. Lawrence.

The Rabell Manufacturing Co., Selma, Ala., will install 2,000 additional spindles.

The Spencer Mills, Rutherfordton, N. C., are erecting an addition to their plant. They will install 2,000 new spindles.

A contract has been let to T. C. Thompson & Bros., Charlotte, N. C., for a complete new plant for the Leakesville (N. C.) Woolen Mills. This contract includes the mill building, village and warehouses. The engineers are Robert & Co., Atlanta, Ga.

The Cherry Cotton Mills, Florence, Ala., have retained E. S. Draper, landscape artist, Charlotte, N. C., to prepare a report and general plan on village improvement work.

The Fort Mill (S. C.) Manufacturing Company will build additions as follows: 120 x 60-foot slasher room, 114 x 80-foot dyehouse, 114 x 30-foot opener room and waste building. Each of these additions will be two stories high.

The Prendergast (Tenn.) Cotton Mills are planning to double the capacity of their plant by increasing the equipment to more than 20,000 ring spindles and 10,000 twisting spindles.

The Katrine Manufacturing Co., Greenville, S. C., operating a yarn mill of about 5,000 spindles, has been sold to Charles J. Webb & Co.,, of Philadelphia, and associates. It is understood that a reorganization of the company will be effected immediately and Clinton J. Morgan, of Greenville, will be president. The company was sold by T. M. and M. L. Marchant, W. Symmes and Herbert Lindsay, who purchased it from B. E. Geer about four years ago. The property includes, in addition to the yarn mill, a roller mill, a cotton gin and a well developed water power. The purchase price was not announced.

A contract has been let by the Blue Buckle Cotton Mills, formerly the Manchester Cotton Mills, Rock Hill, S. C., to the Gallivan Building Co., Greenville, S. C., for the construction of a new weave shed extension, a dye plant and about 100 additional cottages. The construction work will begin January 5.

The Watts Mills, Laurens, S. C., will install electric lights throughout for their village streets and their operatives' houses. The installation is to be modern and complete in every way. J. E. Sirrine, Greenville, S. C., is the engineer.

The Patterson Mills Company, Roanoke Rapids, N. C., is adding new machinery and building new houses in the mill village at an approximate cost of $300,000.

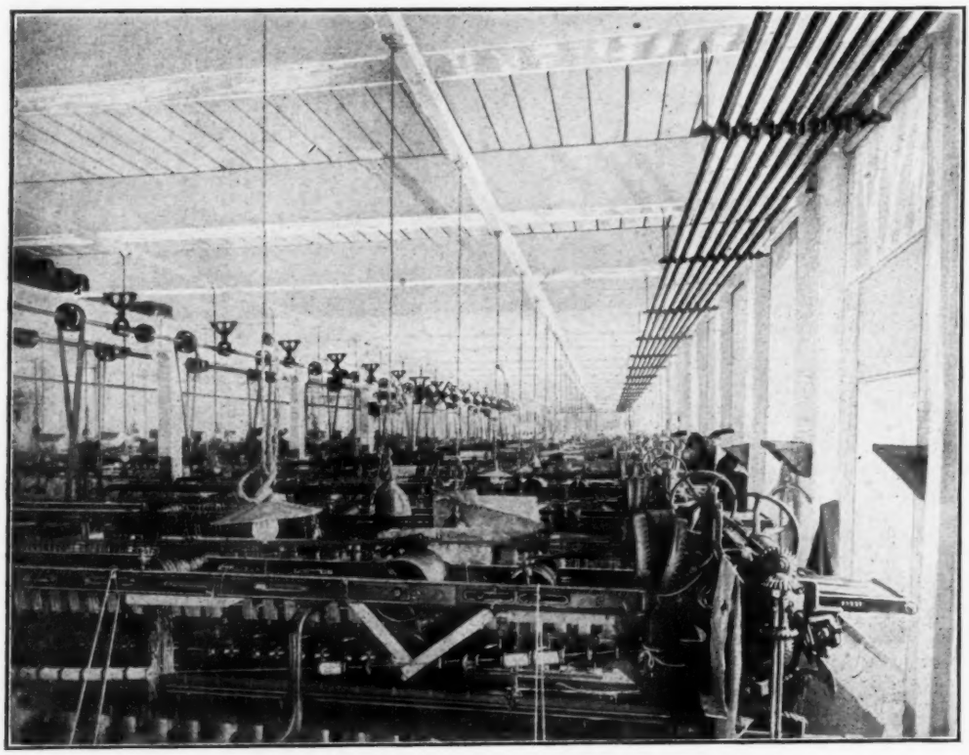
The Caraleigh Mills, Raleigh, N. C., have plans for a new dye house, a new opening room, a new warehouse and additional cards.

The Alba Manufacturing Company has been incorporated for the purpose of taking over the Lloyd Cotton Mills, Stanley, N. C.

The Ray Tire & Rubber Company, Chicago, Ill., will invest $250,000 to build and equip a cotton mill at Birmingham, Ala. This mill will have a daily capacity of 25,000 interliners for automobile tires.

The Lanett (Ala.) Cotton Mills are building a number of new bungalow type operatives' cottages.

Paint our Factory Walls and Ceilings with



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Thomas K. Chaffee Company

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Ground was broken in November for the new construction at the Thomaston Cotton Mills, Thomaston, Ga., which will include a considerable addition to the present mill building as well as the new mill reported some time ago.

The Cedartown (Ga.) Cotton & Export Company have contracted for a number of Alladin houses for the mill village and are planning the construction of a community house in the near future.

Mills No. 1 and No. 2 of the Kincaid Manufacturing Co., at Griffin, Ga., have recently let a contract for the complete fencing of these two mills to the Anchor Post Iron Works of New York. The order was placed through the Atlanta office of the company, of which George W. Forster is manager.

Born almost out of necessity while the recent war was in progress, the Associated Manufacturers of Water Purifying Equipment has now become a permanent organization. Although formed primarily for the purpose of getting the priority committee to enable members of the association to obtain sufficient supplies for the operation of their plants, there were other reasons for the organization which did not disappear with the close of the war. Consequently, at a meeting held in New York in March, 1919, it was voted to continue the association.

Besides establishing friendly relations and cooperation among the members, its work will consist largely of standardization—such as standardization of equipment sizes, or guarantees to customers and of terms of sales. Cooperative advertising, educational campaigns, and freight rates are other matters which will be taken up.

It will be an endeavor of the association to have architects and engineers specify filters in such a manner that all manufacturing companies figuring on the specifications will estimate on filters of the same diameter. This can readily be accomplished by a specification by architects and engineers of what the rate of filtration should be. Benefits from all standardization and cooperation effected by the association will naturally be realized by ultimate purchasers and users.

Committees have been appointed to secure data on the standardization of sizes of pressure filters and to draft standard paragraphs for contract forms. Reports from these comittees were favorably received at the last meeting, held in Pittsburgh, September 9, 1919, and the committees were instructed to further continue their work.

Eligibility for membership in the association is restricted to individuals, firms and corporations regularly engaged in the manufacture and sale of apparatus or equipment for the purification, rectification or sterilization of water.

The present officers are F. B. Leopold, of the Pittsburgh Filter Mfg. Co., Chairman; Arthur M. Crane, of the New York Continental Jewel Filtration Co., Vice-Chairman; and H. G. Tate, of the Borromite Company of America, Secretary.

A meeting of the Associated Manufacturers of Water Purifying Equipment was held in Omaha at the Hotel Fontenelle, Monday, November 17th, at the invitation of W. W. Turner, General Manager of the Refinite Company. This was the first meeting of the association held in the West.

The New England Mill Situation.

The demand of the textile operatives' unions for an advance of 25 per cent in wages in New Bedford and Fall River mills to is be settled by December 1. For the first time in many long months resistance to the demand is taking real form among manufacturers of all kinds. It is contended that while wages have gone up 108 per cent in three years, living costs have gone up but 75 per cent in the textile communities of New England. The wages for weaving have gone up for four years almost without intermission, the only setback being when a 48-hour law went into effect. The price paid for weaving a 47½ cut of 28-inch 64 x 64 print cloth at Fall River is 38½ cents now. In 1898 it was 16 cents.

The question that is uppermost now among manufacturers who are looking ahead is whether it is not more prudent to forego further wage advances in order to hold for a long time what has been gained in the readjustment of textile labor values during the war. Textile work was underpaid before the war in relation to other occupations. During the war it has been found that consumers are willing to pay prices that will sustain the wage advances that have occurred. In the same way they have paid prices for cotton goods that have warranted farmers in looking at 25-cent cotton as nothing abnormal in these times. It used to be said that the public would not pay more than 12½ cents a yard for a bleached muslin 36 inches wide. They are now paying from 39 cents to 45 cents a yard for the same goods.

It used to be said that prints could not possibly retail freely when priced at over 5 cents a yard at the counters. Today they are priced at 20 cents a yard at the mills. But there is a limit beyond which consumers cannot go and it is believed that the limit has either been reached or is very close at hand. There are signs of an exhaustion of the power to pay the high prices asked for cotton goods today.

The conservatism that has been spreading in the past month has been apparent among manufacturers. They have seen prices rising despite the known difficulty of getting full retail prices and they have become very cautious about their sales. The credit expansion in the trade has been very great and mills and merchants have been more careful in all their credit risks. This conservatism is now being reflected in firmer talk among manufacturers against going forward granting continued wage advances on which still further advances in cloth will be predicated. If wages go up and costs of production go on increasing it is inevitable that the pressure to advance prices will increase. Eventually it will mean a crash and stocks will accumulate and mills will have to stop. In this way operatives will be unable to earn.

The mills have very large orders in hand and most of them are committed on contracts for deliveries running into February. Many are sold ahead into June. The demand for goods was very active in the first half of November but when the stock markets collapsed and the rise in cotton was checked, buyers of goods pulled out and there was a little decline in the prices procurable for print cloths. Yarns held steady. At the present moment the hesitation is more general.

In some measure this is a healthy thing as merchants see it, as they say the rise has been too fast to be safe, and the price plane is too high to warrant hopes that consumers can go on paying for all the goods that can be produced. A moderate revision of prices, they say, will not do any great harm as the margin is still very wide for the mills and a shrinkage can be taken now without the danger that may be forced if the expansion of credit continues unchecked. Several large mills are conscious of unusual risks, especially those that are called upon now to outline a policy of selling for fall delivery, 1920. Some of these mills have already notified the trade that new selling conditions and terms will be necessary.

Cotton blankets and napped goods are being offered for fall by some of the large mills. Buyers are invited to place their orders, deliveries to begin in May and July but prices are not to be named until February. Every order booked is understood to be a firm order. The goods will be made and held for the buyer. In some instances goods are being sold at current prices for delivery in the next 90 days. Many of these goods will probably be carried over into the fall season. The prices are lower now than they are likely to be later on, provided the contemplated wage advance becomes necessary and other costs go on rising.

The merchandising condition in many respects is unlike anything hitherto known. Retailers have been ordering goods in advance very freely and some of the jobbers have the largest orders booked they have ever known. These orders will amount to little in event of a further restriction of financial credits or a drop in prices, yet the jobbers are committed to the mills to take in what they buy. The mills are generally conscious that many goods are in light supply. In fact their own mill supplies are hard to get and many stocks are lower than they were a year ago. The lack of production this year is now being felt as well as the normal effect of continued exports. There is scarcity, and at the same time the expansion of credit due to high prices, makes that scarcity more acute.

Some of the buyers of dress ginghams for the cutting trade want mills to take orders now for fall 1920. Yet many mills are far behind on deliveries of spring orders through inability to produce. Production has been gaining somewhat since cold weather but it is very far below normal in many centers. There are spots where higher production is not being encouraged because of the lack of desirable help. Agitators and those who work only in winter months, are not wanted in the mills, and manufacturers prefer to allow machinery to stand idle rather than bring into the factories an undesirable lot of restless spirits.

No mill complains of not having business enough. Orders are good and profits large. The financial reports made to stockholders in the past month have been of a remarkable character. Mill stocks and mill dividends continue on a higher plane than in normal times and debts have been wiped out. In some places the demand for new machinery is so urgent that purchases are being made at the highest prices ever paid. In Rhode Island at the present time there is more mill building underway or contemplated than has been true at any period in recent history. If the machine shops could take on further business there are many mills that would expend surplus funds in needed additions and repairs, not to speak of many replacements that would be desirable after the long period of activity during the war.

The northern New England mills are now operating under better conditions than have prevailed at any time during this year. The seven weeks' strike at the Naumkeag

Barrett Specification Roofs

20 Years of Service Guaranteed—

IN the old days buying a roof very often proved to be something of a gamble.

Maybe you got just what you specified, and maybe not.

The cost per square foot was too often taken as the only standard of value—frequently to the owner's subsequent sorrow.

Today all this is changed.

It was the Barrett Specification which first made it possible for building owners everywhere to obtain, through their local contractors, a *standardized roof,* worked out by roofing engineers and based on scientific principles of modern roof construction.

Today we offer to *guarantee* Barrett Specification Roofs *for a period of 20 years!*

This guaranty is obtainable on any roof of 50 squares or more, in any town of 25,000 population or over, and in smaller places where our Inspection Service is available.

It is a Surety Bond, issued by the U. S. Fidelity & Guaranty Company, of Baltimore.

To obtain this Surety Bond you have only to insert in your building Specifications the following:

"The roof shall be laid according to The Barrett Specification dated May 1, 1916, and the roofing contractor shall secure for me (or us) the 20-Year Guaranty Bond therein mentioned."

The guaranty costs you nothing. We merely require that the roofing contractor be approved by us and that we be given an opportunity to inspect the construction.

We shall be glad to send you a copy of *The Barrett Specification,* with diagrams ready for insertion in your building plans.

UNITED STATES FIDELITY & GUARANTY COMPANY

Barrett Specification Roof

20 Year Guaranty Bond

The 20-Year Bond

We illustrate above the 20-Year Surety Bond that will be given on all roofs of 50 squares or over in towns of 25,000 population or more and in other places where our Inspection Service is available.

New York, Boston, Cleveland, Birmingham, Seattle, Youngstown, Nashville, Chicago, St. Louis, Cincinnati, Kansas City, Peoria, Toledo, Washington, Duluth, Richmond, Elizabeth, Milwaukee, Latrobe, New Orleans

The Barrett Company

Dallas, Bangor, Bethlehem, Salt Lake City, Atlanta, Columbus, Philadelphia, Pittsburgh, Minneapolis, Baltimore, Lebanon, Buffalo, Detroit, Johnstown

THE BARRETT COMPANY, Limited: St. John, N. B., Montreal, Halifax, N. S., Toronto, Winnipeg, Sydney, N. S., Vancouver

Laying a 20-Year Barrett Specification Roof on Building No. 20 of the National Cash Register Co., of Dayton, Ohio

mills was fought out by shutting the mills down. This policy was successfully pursued by some of the Maine mills where local outbreaks were fomented by I. W. W. interests. During the past month or two, and notably in some of the large centers, the police, manufacturers, and the operatives themselves, have cooperated to rid their communities of agitators whose prime purpose is not a real alleviation of just grievances. Those who are at work and are known as steady people, have become better acquainted with the folly of going on making demands that cannot possibly be met.

It remains to be seen whether the temper of operatives will stand a resistance to wage demands on the basis of 25 per cent advance or any advance at all at the present time. During the past three years, the unions at Fall River have lost three of their most experienced leaders, two by death, and one by resignation, the latter due to age. It remains to be tested, whether their successors are conservative or radical, or whether they can control the rank and file as in the past.

The printers and finishers are very busy indeed. All of them state that they have more business than they can handle and some of the large printers have work enough to keep them fully employed for five months. In several instances goods purchased by these factors have been withdrawn from sale as it is impossible to go on booking orders with few hopes of being able to make the deliveries sought. Percales, prints, cretonnes, sleeve linings, voiles, and other fine goods are especially wanted.

The cotton conditions have caused a great deal of anxiety in this section. The large use of grade cotton makes the burden of the crop failure hardest on this section. Some effort has been made to secure Egyptian cottons in larger quantities than usual for fine spinning to make up for the dearth of long staple American grades. Peruvian cotton is also being brought in in larger quantities. But these supplies meet only a small part of the needs. Several fine goods mills have concluded not to go on accepting business on yarns finer than 80s or cloths that require the finer yarns. It seems probable that the low grade of the current crop will result in the production of more heavy goods than is usually the case but that will tend to make demand for the limited amount of good white cotton in short staples unusually active.

Because of the preponderance of short staples the practical manufacturers foresee much difficulty during the coming summer. Poor spinning cotton invariably brings on troubles with operatives. Poor yarns mean constant breakages and irregular short staples mean slower carding with larger quantities of waste. The reports that are being received indicate that manufacturers are doing what they can to conserve some part of their good cotton for use during the coming summer in order to avoid friction. Wages are already so high that workers do not need to keep as busy as usual in order to meet their bills and any cotton troubles in the summer will materially reduce the output.

"The Boll Weevil Problem—Its Solution," is the title of an interesting booklet published by the Junior Farmer Company, Atlanta. The work, which goes into the great problem facing the producers of cotton in the South, is compiled by A. Lee Andrews, assisted by a number of experts, who, having studied the cotton destroying insect are thoroughly conversant with the boll weevil problems.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, November 17th, 1919.

Not until the market crossed the 40 cents level for middling spots in the interior and at the ports, some points recording the high level of 43.50, did the advancing tendency of the market come to a halt, although values were higher than for 50 years.

The abnormal price for all commodities, for securities listed on the New York Stock Exchange, and the highest wages on record, made a heavy drain on the monetary centers of the world, New York and London, to conduct business. As a result there has occurred a stringency of funds in the leading financial centers, necessitating an advance in interest rates to 4½ per cent by the Federal Reserve Bank, and to 6 per cent by the Bank of England, and rumors are current of the possibility of higher rates in the immediate future.

Reflecting these developments. call money sold in New York at 30 per cent. the highest since the panic of 1907, and while there has been some relief subsequently, followed by a drop in the call rate to about 10 or 12 per cent, the situation remains nervous and unsettled with the probability of high money until the new year, or until after provisions are made for the payment of year-end dividends.

These developments are responsible for the recent slump in cotton, the recovery from which has been slow, owing to the uncertainty attending efforts for an early ratification of the peace treaty by the United States. The adoption by the Senate of a reservation to Article 10 of the League of Nations. said to be unacceptable to the administration, and high money rates, has had its unfavorable effect on foreign exchange, demand sterling and Continental rates having reached the lowest level on record.

The immediate future of the market, therefore, depends, in a great measure, upon whether the peace treaty is ratified or rejected. Final results are likely to be far reaching as a market influence, if only temporary. If the treaty is ratified the market will probably advance and foreign exchange improve, whereas results are likely to be unfavorable if the treaty is rejected.

Meanwhile there has occurred a falling off in the demand for spots in the South and in Liverpool, with values tending lower except for staples which remain in good request with offerings light.

In event of the peace treaty being ratified soon, the market would likely recover quickly, especially if there is improvement in the financial situation.

Conditions in the metal markets remain strong, new business waiting for booking space. The Steel Corporation reported a gain of 188,030 tons in unfilled orders for October. the total standing at 6,472,668 tons, with several mills closed since September reopening.

The threatened coal miners' strike seems at this writing to be in a fair way for an early satisfactory adjustment, and the same outlook applies to the railroads, made possible by the granting of an increase in wages. Therefore, the fundamental features of general business conditions appear to be sound, mills making every effort to increase production for trade requirements and construction work.

But as the future foreign policy of the United States

C. E. RILEY, Pres.
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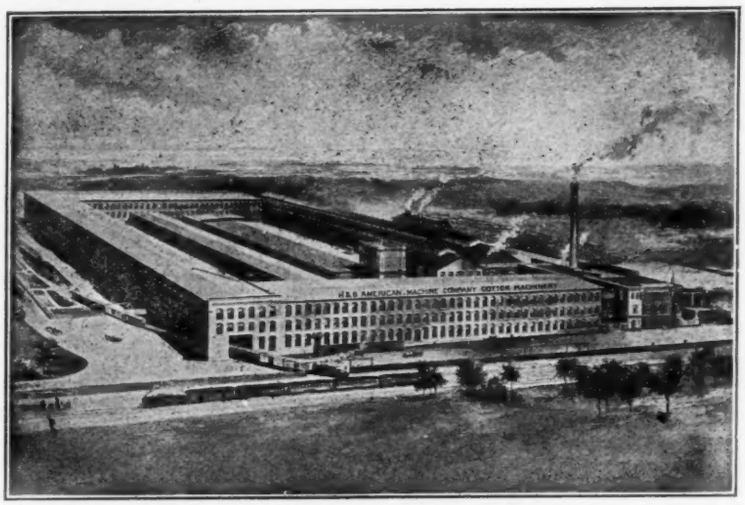
Southern Office
Atlanta Trust Co. Bldg.
Atlanta, Ga.

COTTON MACHINERY

Opening and Picking Machinery

Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

H & B AMERICAN MACHINE COMPANY
PAWTUCKET, R. I.

politically affects all the world, particularly in a monetary way, a rejection of the peace treaty would be a serious blow to the foreign allied nations, and may delay a revival in trade momentarily, but eventually business will likely expand because of the needs of the world, especially Europe, of raw materials and manufactured goods.

As an insight to the progress being made in the textile industry in the United States, it is only necessary to point out that consumption in America of lint cotton during October was 555.000 bales vs. 440,000 for the corresponding month last year; for the first three months of the season 1,549,000 against 1,465.000, while active spindles in the United States at the close of October numbered the greatest on record—34,307,000 compared with 32,736,000 one year ago, indicating larger consumption in the future in America, with prospects of it increasing abroad.

Last week freezing temperatures over the northern half of belt probably killed all late cotton.

The 1919 edition of "A Quarter of a Century in Cotton," a chart sent out annually by A. Norden & Company, Cotton Exchange Building, New York City, has been issued. This chart contains very complete information of the activities of the cotton industry during the last twenty-five years, including the price range, amount of cotton ginned in the United States, acreage planted in cotton, yield an acre, world consumption of American cotton, foreign statistics and other valuable data. Anyone interested in cotton can secure a copy of this chart upon request to the company issuing it.

The Yarn Market.

As the month of November was ushered in, the almost unprecedented rise in all sections of the cotton yarn list which had been in force for some time, particularly during the latter weeks of October, continued to prevail and the upward movement of prices became stronger and continued so through the earlier weeks of the month. However, the market gave an impressive demonstration of the fact that even the altitudes reached in prices, while having a tendency to enforce the wisdom of caution on the majority of buyers, had not reached the point where the demand for yarns was seriously impaired. The demand for yarns was, in fact, well sustained, the buying being done on practically the same lines of business which have been represented in the market for some time past. Some manufacturers were negotiating for spring deliveries; some for delivery in December, while the majority of orders were placed for delivery in January and February.

Prices on all southern yarns soared throughout the first part of the month. Sales were reported on southern ply skeins at $1.33 a pound for 40s. This was 35 cents higher than the peak price reached last summer and a little more than double the year's low figure, registered last March. Even these comparisons, however, fall short in the attempt to measure the extent of the vast appreciation which has taken place in these yarns. Carded warps, two-ply, which were in better demand than skeins, but of a shorter supply, appeared to have begun a new career of "aviating" along the middle of the month, the high spots being in 14s, 16s,

(*Continued on page* 142.)

Notes About Men You Know.

L. C. ROCKHILL who is widely known in the automobile industry, has been appointed sales manager, a position recently created, of the Goodyear Tire and Rubber Company, of Akron, Ohio.

The appointment, coming as it does, at a time when the Goodyear company is able to announce the close of the most successful year in its already remarkable history, with a total gross sales of over $169,000,000, will attract wide attention to the man who will direct the sales policies of this great American industry whose activities reach to the far corners of the world.

Mr. Rockhill has been with Goodyear over twelve years. Previous to that time he was in the advertising department of a Cleveland newspaper. His first service with Goodyear was in the repair department, which was a subdivision of the automobile tire department, handling repairs and adjustments. He was successfully made manager of the aeronautical department, manager of the automobile tire department and assistant sales manager in charge of tire sales.

The Goodyear announcement is in line with their consistent policy of recognizing ability and rewarding loyal service in their ranks, and Mr. Rockhill's advancement to the position of sales manager follows naturally, by virtue of his long experience with sales work.

C. A. MITCHELL has resigned as overseer of weaving at the Royal Bag Manufacturing Company, Charleston, S. C., to take a position as night overseer of weaving at the Republic Mills, Great Falls, S. C.

R. P. BARTON, overseer of spooling at the Lancaster (S. C.) Mills, has resigned and accepted a position as second hand in the filling and spinning department of the Eureka Mills, Chester, S. C.

E. J. ACKER has been promoted to the position of master mechanic at the Riverside and Toxaway Mills, Anderson, S. C.

S. B. EVANS has been appointed spinning overseer at the Gluck Mill, Anderson, S. C.

G. B. HUSS has been promoted from overseer of carding and spinning to superintendent of the Anderson Mills, Inc., Lincolnton, N. C.

E. D. BYRD has resigned as night superintendent at the Forsyth (Ga.) Cotton Mills. He was succeeded by C. W. James, who was formerly in the spinning department.

J. J. JORDAN, assistant superintendent of the Jackson Mills, Iva, S. C., is to become superintendent of the mills an January 1 next.

J. J. MCCRARY has accepted the position of superintendent of the Meyers Mills, Gastonia, N. C.

D. E. MCGLANN has been appointed spinning overseer at the Gate City Cotton Mills, Atlanta, Ga.

F. F. FERGUSON has resigned as night overseer at the Pomona Mills, Greensboro, N. C., and accepted the night superintendency of the Greer Spinning Co., North Wilkesboro, N. C.

J. A. HEMRICK, who has been connected with the McIntosh Mills, Newnan, Ga., for several years, has been promoted to the position of master mechanic of the mills, succeeding T. Y. Lovern, who has resigned and accepted a position with the Columbus (Ga.) Power Co.

C. C. MCVICKERS, formerly overseer of spinning at the Fidelity Mfg. Co., Charlotte, N. C., has accepted the superintendency of the Atlanta (Ga.) Twine & Cordage Co.

S. G. DOVER has succeeded N. S. Hull as superintendent of the Eureka Mill at Chester, S. C.

H. D. FUNDERBURK, formerly overseer of weaving at the Eureka Mill, Chester, S. C., has accepted a position as overseer of weaving, slashing and cloth room at the Arcade Mill, Rock Hill, S. C.

B. J. FISHER has resigned as superintendent of the Merrimac Mills, Huntsville, Ala., to operate a mill of his own.

S. H. CHILDERS has resigned as overseer of weaving at the Hamilton-Carharrt Mill No. 1, Rock Hill, S. C. He was succeeded by W. E. Baker.

CHARLES D. VOSS has been made general manager of the Buck Creek Mills, Siluria, Ala.

R. P. SWEENEY has resigned as superintendent of the Social Circle (Ga.) Cotton Mills to become superintendent of the Buffalo (S. C.) Cotton Mill. He was succeeded by W. L. Phillips, who was formerly overseer of spinning at the Avondale Mills, Birmingham, Ala.

M. T. POVEY has resigned as overseer of spinning at the Cabarrus Mills, Kannapolis, N. C., to accept the superintendency of the Gastonia (N. C.) Manufacturing Co.

C. P. MOSS has accepted the position of master mechanic and chief electrician at the Woodruff (S. C.) Cotton Mill.

C. H. ELDRIDGE has been promoted to the superintendency of the Aldora Mills, Barnesville, Ga.

C. L. GILBERT, formerly with the Franklin Mill, Greer, S. C., has succeeded G. A. Buchanan, resigned, as superintendent of the Darlington (S. C.) Manufacturing Co.

J. A. PRINCE has been appointed assistant superintendent of the carding, spinning and electrical departments at the Meritas Mills, Columbus, Ga.

R. M. MATTHEWS has been appointed superintendent of the new Peerless Mills, Thomaston, Ga.

G. B. MCCOMBS has resigned his position as overseer of weaving, beaming and the cloth room at the Winnsboro

(S. C.) Mill, to accept a position as superintendent of the Inverness Mills, Winston-Salem, N. C.

H. D. AGNEW has been elected general manager of the Lafayette (Ala.) Cotton Mills.

ROSCOE O. ROBERTS and Mill Louise Thayer, daughter of Mr. and Mrs. Lee Carlton Thayer, were married recently at Greenfield, Ind.

R. A. ODUM has resigned as overseer of spinning at the Demopolis Cotton Mill, Shortleaf, Ala., and accepted a position as overseer of weaving at the McComb Cotton Mills, McComb, Miss.

M. C. DAWKINS, formerly overseer of carding at the Echota Mills, Calhoun, Ga., has become superintendent of the Calhoun (Ga.) Yarn Mills.

S. A. LOVELACE, formerly overseer of carding at the Pomona Mills, Greensboro, N. C., has been appointed superintendent of the Tyre Cord & Fabric Co., Columbus, O.

B. D. GADDY has been appointed superintendent of the Golden Belt Manufacturing Co., Durham, N. C.

CLIFTON CORLEY has resigned as general manager of the Necronsett Mills, Inc., Cumberland, N. C., and has moved with his family to Greenville, S. C., where he has acquired a financial interest in and becomes president and manager of the newly reorganized Vardry Mills, of that place. Walter E. DuPre, of Atlanta, is secretary and treasurer.

JAMES S. ALEXANDER, president of the National Bank of Commerce in New York, was elected chairman of the Board of Directors of the French-American Banking Corporation at a meeting of the Board on Wednesday, November 19th. The French-American Banking Corporation, which is located at 67 William Street, New York City, was organized last April with a capital of $2.000,000 and a surplus of $500,000, all paid in. Half of the stock is held by American interests and half by French interests. The American interests are the First National Bank of Boston and the National Bank of Commerce in New York, each holding one-quarter of the stock. The French participant is the Comptoir National d'Escompto de Paris, which holds one-half of the stock.

T. JAMES BROWN, of Everett, Mass., has taken a position in the main office of the Atlantic Dyestuff Company, Boston. Prior to going into the service, Mr. Brown was for many years connected with one of the leading dyestuff houses in Boston in a technical capacity and is, therefore, well fitted for both technical and sales duties in his present position.

The Manufacture of Steel Hoop.

A modern, complete, and continuous steel hoop rolling mill was recently put into operation by the Acme Steel Goods Co., at Riverdale, Illinois. The main works and general offices of this company are at 2840 Archer Avenue, Chicago, where shipping and packing specialties are manufactured, such as box and case strapping, buckles, bands, seals, fasteners, steel mats, etc., together with equipment and tools for the application of these products. This business was organized and commenced operations in 1880. James E. MacMurray has been president of the concern since 1889. F. C. Gifford is vice-president and is in charge of the sales. R. H. Norton is vice-president and secretary and Donald MacMurray is treasurer of the company. During the entire forty years of the existence of this company, especially during the last thirty years, while under the direct management of Mr. MacMurray, the business has shown a gradual growth, the production and sales for every succeeding year having increased over previous years.

Steel hoop has always been one of the specialties handled by the Acme Co., and when this company acquired control of the MacMurray Steel Hoop Co., about two years ago, plans were immediately formulated and completed for the construction of the hoop mill at Riverdale. This place is but seventeen miles from the loop district of Chicago, strategically located as to railroad transportation, being served by three railroads; and, also, being located on the Calumet river, it will have direct connection with lake shipping.

This new operation is located on a site comprising 130 acres. The mill was designed and erected by the Morgan Construction Co., Worcester, Mass., who also furnished the entire equipment with the exception of the power plant and a fifteen-ton traveling crane. The structure is 704 x 84 feet, and the construction is of sufficient strength to enable the operation of two fifteen-ton cranes.

This new hoop rolling mill is operated entirely by electricity, and the power plant consists of three motor units with regulators, of General Electric Co. make, as follows: one 1,800 k. w. motor for the finishing mill; one 900 k. w. motor for the roughing mill, and one 150 k. w. motor for the billet furnace, which is of sufficient capacity to gasify thirty tons of high grade Eastern coal daily.

The manufacturing procedure is continuous, there being no backward movement whatsoever. The eastern end of the mill is devoted to storage space for billets. These billets are 30 feet long, weigh approximately 225 lbs. each., and are 1½ inch square. The hoop footage, of course, depends upon the width and thickness of manufacture. The billets are handled from stock in bundles weighing about 15 tons each by means of the large cranes to a concrete dock whence they are placed into the furnace, which has a capacity for heating 15 tons of billets, and the time consumed in the heat is about one and one-half hours. From the furnace the heated billets pass into the roughing mill, where they are run through six stands of 12-inch rolls and one stand of vertical rolls, being "roughened" into bars preparatory for the finishing mill. After passing through the roughing mill, the steel passes through the edging mill and thence into the finishing mill which consists of five stands of ten-inch rolls, completing the manufacture into long hoop steel. The time consumed in this procedure is about twenty-five seconds for each billet. From the finishing mill the rolled steel is wig-wagged into serpentine form through what is termed the vibrator, onto a steel platform about 100 ft. long which carries it to the reelers.

The operations in this plant are entirely mechanical. Leaving the furnace, the steel is manhandled but once to the time the hoop is reeled, and that to fasten the end of the hoop to the reeling apparatus. There are two of these automatic reelers, and it takes but a few seconds' time to reel the long strips of steel. After being wound, the reel is placed onto an automatic water cooled muffled conveyor 250 feet long, where it is gradually cooled and annealed as conveyed, and upon reaching the end of the conveyor it is strapped and ready for either storehouse or freight car, as circumstances may require.

BLEACHERS!

Better bleaching is wanted by the Public, by the Selling Agent and therefore by the Mill.

It cost nothing to get the dope from us about Peroxide bleaching.

Inform yourself. See how simple and safe it is and that it does not cost any more.

After that: Show it to the boss.

He'll be glad and he'll prove it.

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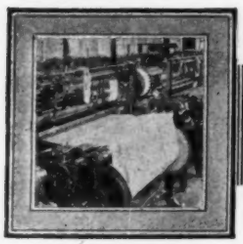


How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

Making the Silent Sentinel Talk.

EDITOR COTTON:

The sprinkler head, often referred to as "the silent sentinel," is used in almost every modern mill as a protection against fire, and since its introduction, it has drowned out what would have been disastrous fires in many cases. The weakest point in its efficiency is the fact that it continues to spray water after the fire is all out, and sometimes the loss caused by the water is greater than the loss by the fire.

When a fire breaks out in working hours, someone is usually around in the vicinity and can turn the water off, after the fire is extinguished, with the result that the water does little or no damage. Oftentimes the operatives put the fire out with hand extinguishers before the sprinklers go off.

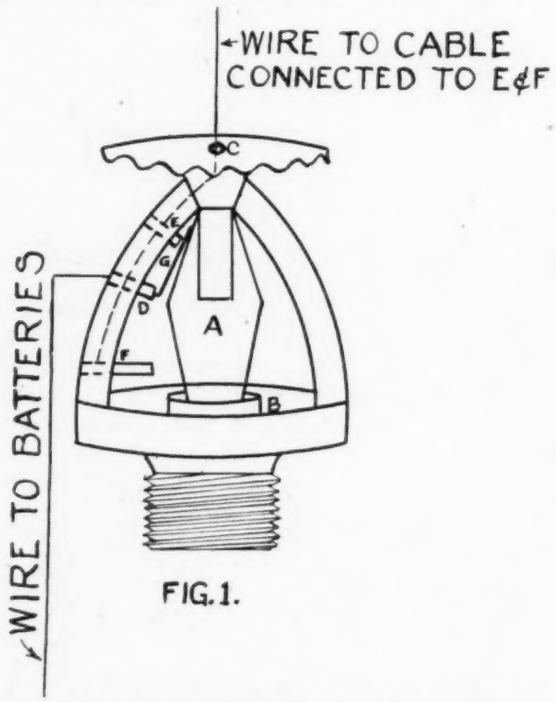


FIG. 1.

When a fire breaks out at night it is a different story. The sprinkler operates and continues to run until the watchman discovers it running, and shuts it off. If the head, or heads that operate happen to be near finished goods or delicate machinery, such as cards or combers, the water will do more damage than it would if the watchman knew just what head was operating and could go right to it. If the fire is small he should shut the water off when under control; if it is large he should get help to take care of it.

But right here is another trouble—sprinklers have been known to go off without any fire burning in their vicinity. In a mill in my state, the sprinkler pipe riser to a picker room recently froze up and forced all the sprinkler valves in the picker room. There was no watchman, and in the morning the picker room had a couple of feet of water in it, and a fire engine had to pump all morning to pump it out. This is, of course, an unusual accident, but in cold cotton storehouses and many other parts of the mill, the sprinkler system is liable to freeze up unless a dry pipe system is used and where would the mill be if the fire started then?

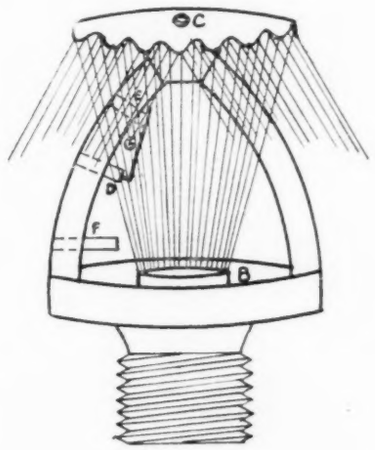


FIG. 2.

In order to overcome these difficulties I think that an alarm should be provided on every sprinkler head which would indicate on a board just the location of the trouble.

The most practical method of accomplishing the alarm is by electricity. Referring to Fig. 1, the fusible lever A, holds the glass cup B over the valve. When the fusible plug A melts, the cap B is thrown out and the water forces up against the disc C. At D is one pole of the electrical circuit, which, when connected with the pole E or F, completes the circuit. The lever G is a conductor of electricity and is hinged at D to one pole, and rests against the fusible plug. When the fusible plug melts, the support of this lever, G is removed and its tendency is to drop, but the force of the water rushing up will carry it up against the pole E as shown in Fig. 2.

Now suppose the water is frozen up and the fire breaks out and melts the plug A, the support of G is removed and as there is no water to force this lever up it will drop out and connect with the pole F. This shows how the alarm should be operated.

In each room a board must be provided with a small electric lamp or a number; on the same principle as a telephone switchboard; for each head in that room. Every head is connected to a lamp or a number on that board, and when a head operates, it indicates on this board. Now this board must be connected with a similar board in the office or watchman's house, which will serve as a master board. This latter board will indicate the rooms and when

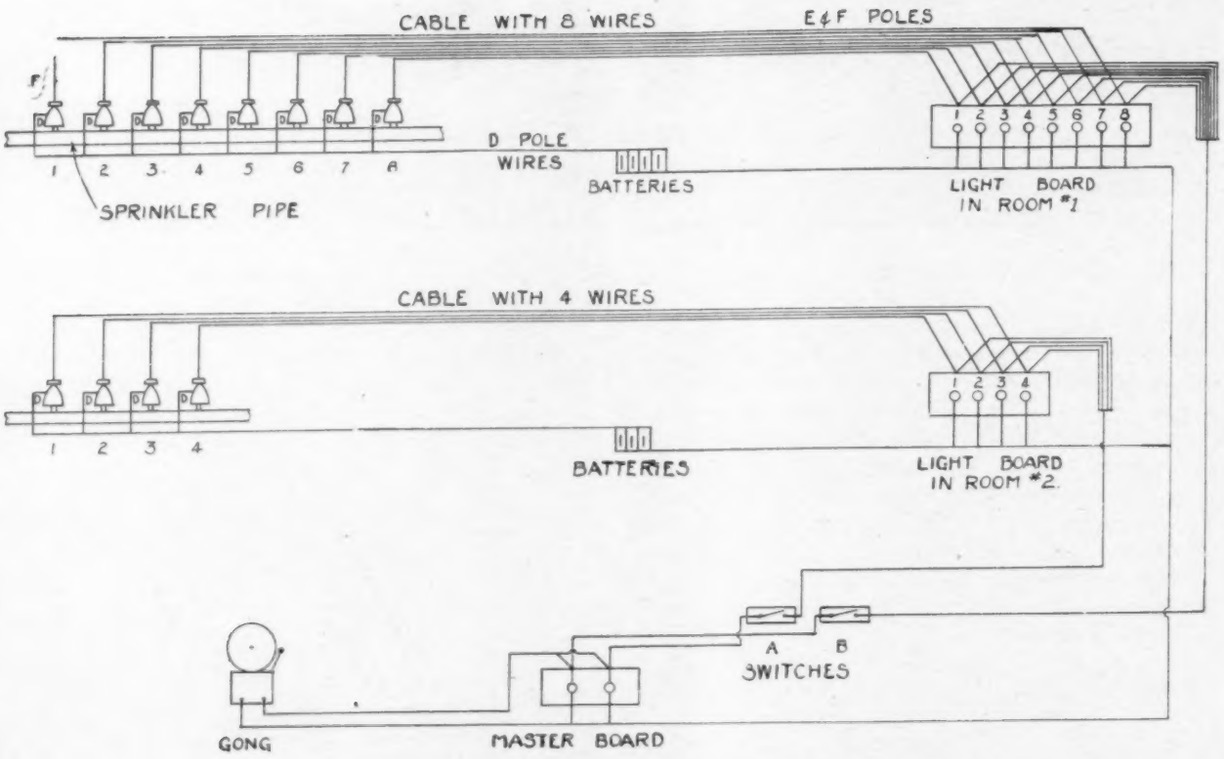


FIG. 3.

a room board is indicating the particular head, the master board is indicating the room. It might be well to connect this board with a large gong at the mill gate and in this manner give a general alarm of fire.

Fig. 3 shows the method of connecting up the heads with the boards.

The poles D on every sprinkler should be connected to one wire which runs along the water pipe. This wire should run to the batteries. The other poles must have separate wires and would have to be cabled under or over the pipe.

With the wires connected as shown in Fig. 3, when a sprinkler operates, say in Room 2, all the lights on this room board will light, but on the master board only Number 2 light will light, and the large gong will ring. The watchman must throw the switch A off, which will stop the gong ringing and put out all the lights on the master board and all the lights on the room board except the light corresponding to the sprinkler that is operating, so that when the watchman arrives in the room where the fire is, the room board will indicate the sprinkler. It will be seen that a switch must be used at the master board for every room in the mill.

This system can be varied in any way to meet conditions; I am just giving a general plan according to my ideas. A mill man with this system can go to bed at night and feel that in the morning his factory will not be burned up or flooded. M. W. H. (Mass.)

The mill village of Hamilton Carhartt Cotton Mill at Rock Hill, S. C., will be greatly extended to meet the requirements of the new mill addition. The village layout and engineering work is being developed from plans by E. S. Draper, Landscape Architect & City Planner, Charlotte, N. C. and New York City. N. G. Walker of Rock Hill, S. C. is architect of houses and structures.

A Suggestion on Fire Protection.

EDITOR COTTON:

A recent napper room fire in an Eastern bleachery presents some possible causes and probable preventatives in such a case.

The nappers are arranged along the east and west sides of the room. The lint from the nappers is drawn from the machine by two fans in the floor below from which it is delivered to the collector on the roof, the lint being finally delivered to a small dust house on the ground at the junction of the bleachery and the bleachery extension. The air, which is used over again, is returned through a screen chamber in the napper room. This chamber is of wood frame covered with cloth. The fire, discovered on the napping machine, was sucked into the lint collecting pipes and blown through the collector on the roof, returning to the napping room through the screen chamber. The fire, feeding on the accumulated lint in the collecting system and great intensified by the two large fans, quickly destroyed the screen chamber and opened a large number of sprinklers. When the fans were stopped in about five minutes, the hot air flared back through the collecting pipes, igniting the lint on many nappers, and filling the room with smoke. The smoke, escaping through the open window, attracted the attention of the mill men, and a hose stream was brought in by the mill fire brigade at each end of the room and the 1,000-gallon Underwriter pump started. The engineer at the second pump did not get the signal to start and this pump was not used.

After about one-half hour the fire was apparently extinguished and the post indicator valve controlling the sprinklers was closed. Five minutes later fire was discovered in the wooden partition near the screen chamber and the post indicator valve was opened again. Fire work-

ed up through this partition to the open wood cornice overhanging the bleachery roof and a third hose stream was used at this point. In about one and one-half hours the fire was completely extinguished, after badly charring the wooden end of the room and posts and ceilings of two bays and the woodwork on a few of the nappers. There was some fire damage to the napper clothing, but the principal damage was from water. A large amount of the goods in process was damaged, some by being burned and others by water in this room and leaking through to the finishing room below. One motor was found to have burned out and there was some damage to belting. Of the 128 sprinklers in the room, 108 opened. These were piped on the modern schedule excepting in the screen chamber against the wooden end of the room where the collector pipes obstructed the heads and two necessary heads were lacking, leaving a distance of about 18 to 20 feet between two of the heads in the center of the chamber.

The extent of the charring in the three end bays nearest this point indicates there was a considerable period of time when the supply of water to the heads in these bays was scant or lacking entirely. Later examination of these branches revealed the presence of some scale in the pipes. There was also indication by the water marks on the ceiling that the pressure in the sprinkler system was at some stage of the fire too low to give complete protection to the north half in which all the sprinklers opened. The unusually heavy draft on the fire system by hose streams and sprinklers together was undoubtedly more than could be supplied by the single fire pump and the reservoir.

This fire shows the danger of this method of returning air to napping rooms direct from large lint collecting systems and the great danger of introducing combustible screen chambers in the path of the returning air. Need is also shown of unusually strong and unobstructed sprinkler protection at extra hazardous points, especially where close to large wooden partitions. The loss in this fire was estimated to be between $15,000 and $20,000; the use and occupancy loss, $6,000. H. A. T. (R. I.)

"Weather—and the Story of How It Is Manufactured," is the title of an interesting booklet being issued by the Carrier Engineering Corporation, 39 Cortlandt Street, New York City. It is written up in an unusual and attractive manner, being the work of "The Mechanical Weather Man," and describes how the Carrier air conditioning and drying equipment is manufactured and the results of using this system. The book also contains photographs showing installations of this equipment in many kinds of manufacturing establishments and amusement places, as well as homes. This book can be secured by our readers upon request to the company issuing it.

John Campbell & Co., manufacturers of aniline dyes and coal tar products, New York, have a southern office established at 26 West 5th Street, Charlotte, N. C., under the management of A. M. Burt. The factory of this company is located at Newark, N. J., and manufactures a full line of dyes for cotton, wool and silk. Mr. Burt, the southern manager, has been in the dyestuff business about eight years. He is a graduate in textile engineering from the Georgia School of Technology.

A Suggestion on Crate Making.

EDITOR COTTON:

In the many years that I have been a reader of COTTON I have gathered numerous good ideas and suggestions therefrom, especially in the section called "How Other Men Manage." While I never felt that I could contribute to any great extent to this department, still I appreciate that it is the duty of each of us to call attention to a good thing when we see it.

Now, Mr. Editor, I do not expect any pay for this suggestion as it is not my own idea, but is taken from a circular sent out by the Safepack Paper Mills of Atlantic

Ave., Boston. However, it is so simple and so worth while that I believe you will consider it well worth the space.

To most people, a box is a box and a crate is a crate, and that's about the end of it. But there are tricks of building them that give one man four times the strength with the same nails and lumber that another man would get. This is particularly true with crates. For a crate lacks the solid sides nailed all the way that give strength to a box. It must rely on its design, its bracing and its nailing for its safety. And its sturdiness depends more on the way the eight corners are put together than on anything else. There are several ways of nailing up these corners, but the most efficient joint is the "three-way" combination shown in the diagram.

The secret is so to join the end-frame piece "Z," the side-frame piece "Y" and the top- or bottom-frame piece "X" that each piece of lumber is held firmly by nails driven from two directions. Piece "Z" is secured by the nails or bolts "AA" and "BB," piece "Y" is held by the nails

Prize Contest

Now that the war is over, and with cotton and labor costs higher than ever before known in the industry, every mill superintendent and every department head is studying up new methods to aid in securing a greater production of high quality goods and at the same time reduce the unit cost.

As the largest monthly textile production journal in America, COTTON is anxious to tell its many readers what the other fellow is doing to aid in this work of increased production. Therefore, it is offering a First Prize of $20.00 and a Second Price of $10.00 for the two best suggestions received between December 1st, 1919, and March 1st, 1920. All acceptable letters will be published in that Department of COTTON entitled "How Other Men Manage" and will be paid for at the regular rate whether or not the article wins a prize.

Mill men desiring to compete for the prizes should decribe in detail the methods or practices adopted, showing drawings or sketches where necessary and giving results in actual figures where possible. The name of no mill will be mentioned and no indication as to the identity of the author of any article will be given other than the name of the state where he is located. The only exceptions as to the authors' names being the two prize winners which will be announced in the April, 1920, number of COTTON.

There is no limit to the number of articles a contestant may submit and the accomplishment described need not be in his own mill or department, although he must necessarily be thoroughly familiar with all the details and results in order to successfully write about them. Articles may be sent in at any time between the dates named and should be addressed to The Contest Editor of COTTON, Atlanta, Ga.

or bolts "BB" and "CC," and piece "X" is gripped by the nails or bolts "CC" and "AA," Each piece is locked by a tight union with the other two strips. All nails are driven into the side grain of the wood, which gives the greatest nail-holding power. It can't spring and it can't be taken apart without breaking the lumber or drawing the nails.

Another advantage of this "three-way" corner is the fact that it gives the crate the maximum carrying capacity with the minimum displacement; for the inside is perfectly rectangular, and only one piece of lumber intervenes between the contents and the outside surface of the crate at any point. M. M. (Georgia.)

Designs for Fancy Cotton Fabrics.

(*Continued from page* 98.)

nesses for all those face threads which do not take part in the development of the figures, and 1 harness for all the ground threads.

The cloth in its finished state as illustrated in Fig. 213 contains 86 threads per inch for face and 43 threads per inch for ground. This is equal to 129 threads per inch; and the 138 picks per inch for face and 92 double picks per inch for ground, is equivalent to 322 single picks per inch of filling. The complete design occupies 192 face and ground threads and 120 face and ground picks.

In the last two examples the appearance of the spot figures on the design paper is very much elongated in the way of filling—the vertical direction—as compared with the corresponding figures on the cloths; this is due to the fact that the design paper employed has the same number of small squares each way per large block,, whereas the

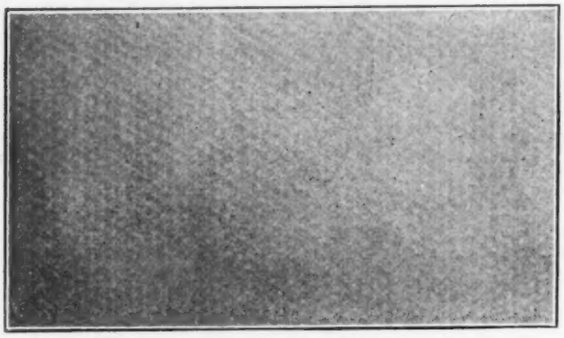


FIG. 215.

number of picks per inch in the cloth greatly exceeds the number of threads per inch. In order that the spot on the design paper should be proportional to that on the cloth, the design paper should be ruled to correspond with the number of threads and picks per inch in the cloth.

Another example of a spot figure is illustrated in Fig. 215; it differs from that in Fig. 213 only in the character of the spot. Following the same principle as in the last example, we have selected one of the figures with a few surrounding threads and picks for illustration as in Fig. 216. The markings have the same significance as those in Fig. 214.

The ground picks of the present example are all double, but they are shown by single rows of small squares in Fig. 216. The ground picks are brought to the surface to form the spot figures, but it will be noticed that at all other points those picks take up a position under the face threads and picks and over the ground threads.

As before, the warping is one thread face, one thread ground, one thread face, or equal to two of face to one of ground, while the order for the filling is one pick single for face and one pick double for ground for 4 repeats and then two picks single for face. This is equivalent to 6 picks of face to 4 double picks of ground.

The design in Fig. 216 starts with the last pick of the two face picks. It is on these two face picks that the ground threads are all lifted as shown on the dots, and in the cloth this arrangement forms the furrows between the pronounced ribs.

For one complete unit of the design there are 128 face threads and 64 ground threads interweaving with 96 face picks and 64 ground picks or a total of 192 threads and 160 picks. If this cloth were woven by a dobby—which is hardly likely—then 51 harnesses would be required; 24

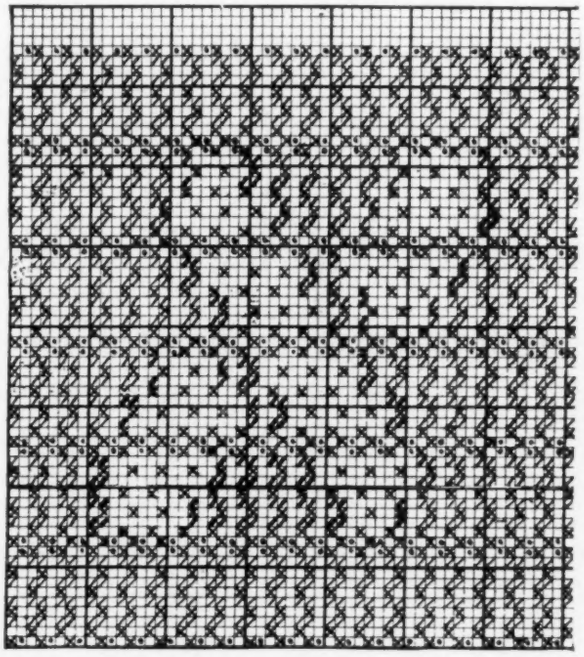


FIG. 216.

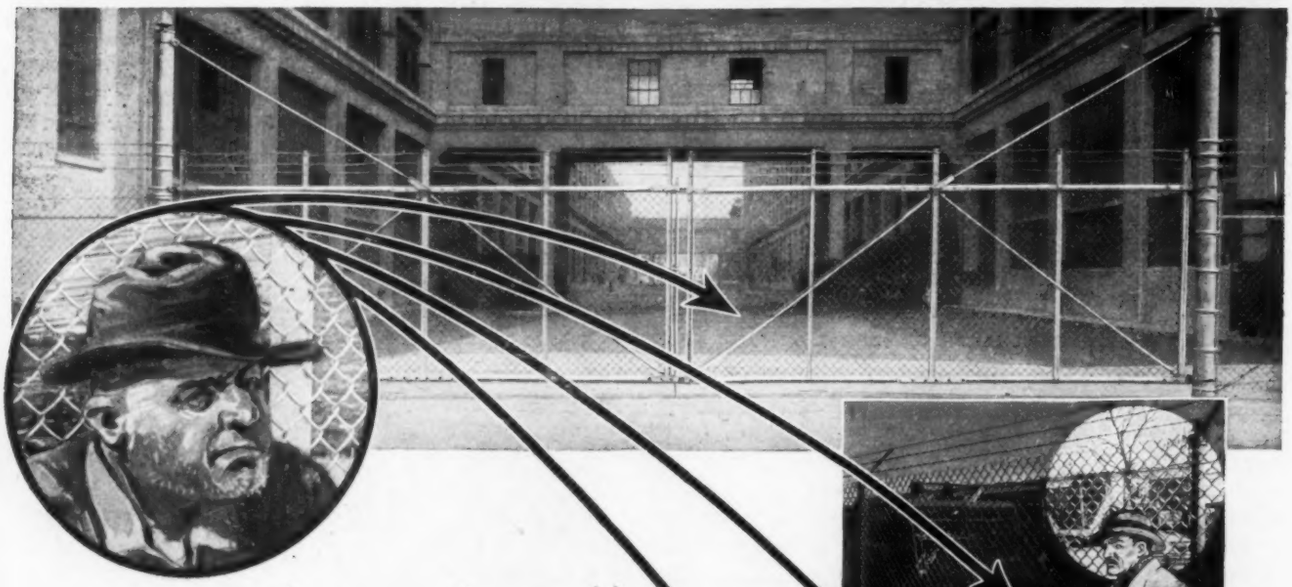
for each of the two sets of vertical figure threads, or 48 for figuring threads, 2 for the face threads between successive vertical rows of spots, and 1 for all the ground threads.

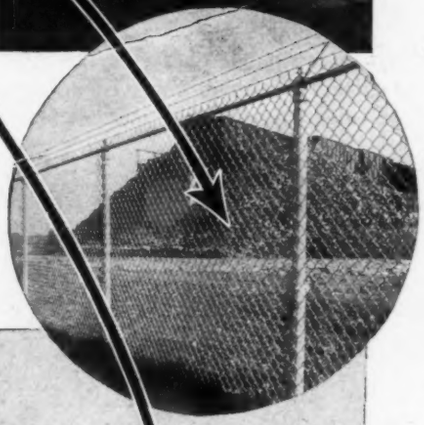
A jacquard machine would probably be employed to operate all the threads in this example as well as in the previous one. If there happened to be prospects of a long run for this style of design and structure of cloth it is quite possible that the work would be accomplished by the joint action of jacquard and tappet shedding appliances; the jacquard harness would control all the figuring threads, while the tappet could be arranged to control the remainder if the picks per round were not excessive.

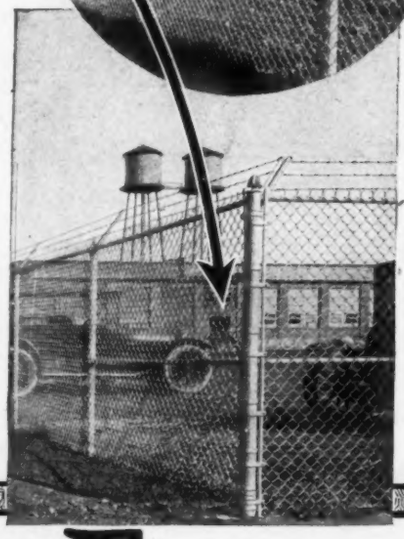
As there are two kinds of filling in this type of cloth, and single picks of each, it would be essential to have a loom with multiple boxes at both ends and a pick-at-will motion.

(*To be continued.*)

An ounce of accident prevention is worth a pound of cure after several operatives have been injured. Protect your workers!







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An Anchor Post Unclimbable Factory Fence carries protection to every point. It's an all around, all time "custodian" of plant and property. It's the insurmountable obstacle in the path of those of evil intentions. It guards with equal strength, day, night, Sundays and holidays, year in and year out. It meets the emergency and the unexpected.

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Books in Industry

BY CRETE HUTCHINSON.

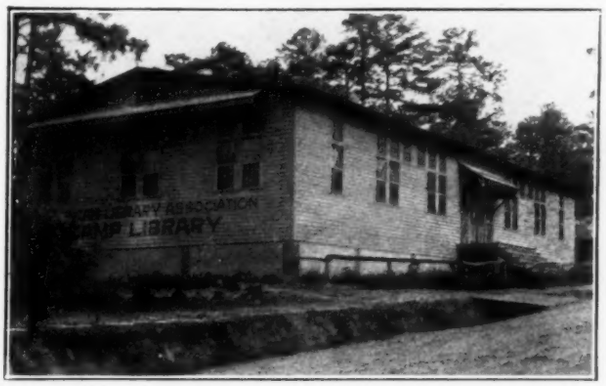
In the enlarged program being considered by the American Library Association, men in industry and business may, through books and libraries, acquire technical knowledge which will result in increased production. The association will foster the development of technical and business departments in public libraries and special libraries in industrial and business concerns, to the end that useful books on every vocation and every task may be made available to all workers. Recently, as a part of this peace-time program, a transfer was made of the Camp Library building erected and owned by the association at Camp Wadsworth to the Textile Industrial Institute of Spartanburg, South Carolina. The institution agreed to maintain and finance a public library and reading room, and provide an ade-

HAMMOND HALL FROM THE SAXON MILL VILLAGE.

quate annual maintenance for library service and the purchase of books. It is the aim of the Textile Industrial Institute "to find, train, Christianize and place men and women to do the thinking for the cotton mill people tomorrow." In a model mill village no student is accepted who does not agree to work in a cotton mill every other week. This rule is enforced even in the case of a few students who are employed in the kitchen and on the truck farm.

The American Library Association in presenting the building aims to assist the institution in its unselfish effort to get real live service, and every effort will be made to increase reading on American ideals, American history, social problems and other subjects, a knowledge of which makes for intelligent citizenship and American standards of living. The library work properly executed assists the instructor to systematize the reading of his students; and in industrial centers such as the cotton trade a selected book list of subjects which even the youthful student can comprehend will be compiled on request by the American Library Association. Carding lessons for the mill boy; carding and spinning, describing calculation, tables of constants, settings, drafts, speeds and twists; exhaustive works on cotton combing or cotton mill processes and calculations, with volumes treating on new methods for determining costs in cotton mills such as labor costs, overhead costs, raw stock costs, with a summary of all costs; suggested treatises on the all-important subject of air-moistening in cotton mills, together with such factory practices which will assist the young student to a better understanding of his work will be incorporated in such lists.

The library building has become the community center, and here the various welfare activities are being stimulated. Lectures are being held in the library, sewing and cooking classes have been formed, and the lecture hall is utilized for entertainments and games as well as for educa-



THE CAMP LIBRARY WHICH NOW OCCUPIES A PROMINENT SITE ON THE SCHOOL CAMPUS.

tional purposes. Approximately one thousand volumes will be placed in the reading room, carefully selected to meet the requirements of the many bright minds and true hearts that have come from the mountain and hill country at the call of civilization. With proper training, leaders develop from the ranks, and with the new environment of the mills, illiteracy, the unfortunate heritage of the remote mountainous sections will be gradually overcome.

The Textile Industrial Institute is the only school of

A SECTION OF THE STUDENT BODY.

its kind in the world, and gives young men and women hitherto educationally disadvantaged the opportunity to earn elementary and high school advantages by their labor. Pupils are not accepted whose parents can pay, and all students must work out their own salvation.

Hidden elements of right leadership are developed, and an independent body of young men trained in the cotton mills will surely tend to dignify the industry. In a recent report submitted, seventy-five per cent of the student body wanted to help improve the social conditions of mill operatives; ten per cent desired to become textile experts; and many wished to become active social workers.

The model mill now under construction will be ready

"WEATHER,

And the Story of How It Is Manufactured"

is the title of my new book, which tells in an interesting, readable way, the fairy tale of Manufactured Weather, in the Textile Mill, and in dozens of other industries, from chewing gum to aeroplanes.

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If you have not yet received your copy, why not

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Yours to make

"Every day a *good* day"

The Mechanical Weather Man

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for student workers in December of this year; but in the meantime, as for the past five years, the Saxon Mills situated in the outskirts of Spartanburg, will cooperate with the Textile Industrial Institute in taking their pupils in the mills on the half-time plan.

Educators throughout the country are very much interested in the practical development of this new and unique educational enterprise. The far-reaching beneficial results have already been felt by the cotton mill industry, and there is a constant increase in the enrollment of new students. The present living accommodations are being enlarged, and the American Library Association was given the opportunity to furnish the additional facility of supplying a place to house the library. This contribution was made to further the realization of the high ideals of the founder, the Rev. David English Camak.

The Manufacture of Domets.

(*Continued from page* 96.)

factory base for the addition of salts, fats, gelatin and all kinds of weighting, softening and thickening materials that may be found necessary for special purposes. The starch basis prepared with diastofor is distinguished by the evenness with which it penetrates and is absorbed by the fibers, and the full, soft handle given to the material. The dressing possesses good adhesive qualities, and consequently gives a supple and closely adherent finish. It does not dust, nor harden, nor contract by exposure, and is, therefore, particularly valuable for sizing rough or napped goods.

Napping, or raising, although it has become such an important branch of finishing is not a process which lends itself readily to description, and if every class of napped finish were dealt with separately, it would require a book to be devoted entirely to the subject to do it full justice.

Napped styles of goods differ as much as the machines used to produce them. Some goods, such as sateens for chamois pocketings to imitate chamois leather and for suede glove finish, require only a faint trace of nap. Goods like blanketings, bathrobes, etc., require a thick felt-like nap, while still others, as many styles of upholstery goods, must have the appearance of plush. The great question in any case is to raise the required nap with as little loss to the fabric as possible.

Until recent years the methods employed in napping were of the most primitive description and the trade was a limited one, but with the introduction of the Grosselin type of machine, which has in late years attained a high standard of efficiency, a new industry has practically been developed, and we now have a great variety of styles of napped cotton goods on the market.

The Grosselin machine, or, as it is commonly called, the "French Napper," consists essentially of a revolving drum cylinder made up of a number of small rollers, each of which is covered with card filleting.

The material to be napped is guided over the rollers and then around the cylinder in such a manner that the card rollers come in contact with it at many points. The small card rollers not only revolve as part of the cylinder, but each is driven independently and revolves around its own axis. It is therefore obvious that by varying the direction of the rotation and the speed of the card rollers, and also by varying the amount of contact with the material, a great variety of results may be secured.

In some cases, where a very slight nap is required, the card rollers are replaced with emery covered rollers, which are allowed to work in more or less contact with the cloth to be raised.

In the single action napping machine, the cloth passes through the machine in the opposite direction to the revolution of the cylinder and the rollers revolve in the same direction as the cloth. Further, the rollers are clothed so that the teeth on them point in the direction of revolution. The machine is suitable for napping all classes of domets and dress goods, starched or otherwise, as previously explained.

The double action machine differs in a few respects from the single action machine. In this machine, the cloth passes directly around the cylinder and in close contact with it without the intervention of the contact and tension bars and rollers which distinguish the single action machine. Moreover, the cloth passes through it in the same direction as the cylinder revolves, and the rollers turn in the opposite direction. All the rollers revolve the same way, but there is one important feature which needs to be recognized and that is that the adjacent rollers are clothed so that the points are in opposite directions. Alternate rollers have their points set in the direction of the revolution and revolve point first while the other series have their points set the other way and revolve back first. A sketch of a machine with 40 carding rollers, with the cloth in work is shown in Figure 1, while Figure 2 shows the direction of movement of the cloth, rollers, and cylinders relatively toward each other. It also shows the alternate setting of the wire. Figure 3 shows setting, etc., for the single action machine.

The double action machine is especially adapted to the finish of the "baby cloths" previously spoken of, glove cloths, and chamois leather finish pocketings, none of which are ever starched.

[This is the third and last of the series of articles on colored cottons.—Editor.]

The Tolhurst Machine Works, Troy, N. Y., manufacturers of hydro-extractors (centrifugals) for textile manufacturing, industrial, laundry and other uses, have recently issued their special catalog No. 18 which is an attractive 28-page booklet, gotten up in a neat style. This booklet contains reproductions of photographs of self-balancing centrifugal hydro-extractors especially adapted to textile, dye, bleach, carbonizing, laundry and allied uses. Photographs are also shown of the Tolhurst center-slung centrifugals. Adequate descriptions accompany all of these photographs. A copy of this catalog can be secured upon request.

The Bureau of Standards, Department of Commerce, Washington, D. C., has recently issued a new publication, circular 41, third edition, entitled "Testing of Textile Materials." The contents of this pamphlet include general information regarding conditions of humidity and temperature; fiber composition and methods of determination of same; general instructions concerning shipping directions, etc., and other material of value to textile men. This booklet is now ready for distribution and those interested may obtain a copy by addressing a request to the Bureau of Standards.

Announcement

Swan and Finch Company

begs to announce that it has
acquired the interests of the

Cataract Refining & Mfg. Co.

The combined business will hereafter be conducted under the name of
SWAN AND FINCH COMPANY.

THE increased facilities for distribution made possible through this change will be of great advantage to the consumer, for all of the products of both companies will now be available at the many points where warehouse stocks will be kept.

The reputation of these products is an enviable one. It is needless to say that the high quality of all will be carefully maintained.

Orders for any of the products of *Cataract Refining & Mfg. Company* and *Swan and Finch Company* will receive prompt attention if directed to:

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Quality Lubricants Since 1853

165 Broadway, New York
532 Hart Avenue, Detroit
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Royal Bank Bldg., Toronto, Ontario, Canada

New York
Nov 15, 1919.

240

Instituting a System.

EDITOR COTTON:

Manufacturing is the result of service rendered. Without service there can be no manufacturing, because manufacturing is the product of service, or rather a combination of services. Having an established system of service, we can get the manufacturing done. But in order to have the service, there must also be a system to follow up the service. Successful manufacturing depends not only upon the service itself, but upon *efficient service.*

On the other hand, efficient service depends upon a definite plan or follow-up system. When service is followed up properly, there is organized effort, and this in turn gives us another important factor in service rendered—that is cooperation. Therefore, the whole fabric of a successful industry depends upon organized service. And in order to secure this, there must be a definite system of following up the service rendered at all points.

Without such a system to follow up the separate efforts there is liable to occur many undesirable things.

Only a few of these will be mentioned, but enough will be pointed out to show the vast importance of following things up and down with a deep interest. Somebody must be sufficiently interested to follow up; do the thinking and the planning. There should be a planning outfit which must be as fool-proof and disaster-proof as possible. And it is just in proportion as this follow-up system is perfect, that the manufacturing will go on as it should and prosper.

The success of an industry depends upon how long or how short it is of follow-up methods. Everything must be followed up. For want of brains in this line, various plants have had many troubles. Some have more, others have less. The great thing now-a-days is to *prevent* the undesirable happenings. Competition is keen. Men of brains are at the wheel of industry, and the most perfect system can produce the most goods at a less cost and outsell the less perfect system.

There is the *best way* to do everything, and experts are falling over themselves in their effort to find out the best way to do things, or to find the perfect system of management.

For want of a good follow-up system, here is what has occurred in some mills: getting out of raw material, coal, oils, orders, help, important supplies, mills have been oversold or undersold. Bobbins, spools and beams have been so completely tied up that things became congested, and the processes blockaded. Sometimes inspections have been neglected, causing serious break-downs, and even the complete destruction of entire plants. Recent fire insurance inspections have found some mills largely unprotected because some main valves were closed. For the same reason, strikes could have been prevented, plants enlarged, and a stronger cooperation secured from cotton to finished cloth.

Where things are not systematically followed up, disastrous things are certain to occur. To illustrate further the importance of the argument, I will give a few instances of actual happenings. Take the simple matter of a weave room temperature and humidity. Most first-class mills keep a careful record of this. One mill, which does not keep a daily record, had the following experience: The main steam heating valve leaked, and the temperature of the weave room gradually rose. At first the leak was small, and the increased heat was not noticeable. It was during the warm autumn months that this occurred. The work began to operate poorly. The increasing temperature became oppressive to the help, and they were gradually dropping off from duty. Finally the management got busy, and discovered the trouble after thousands of dollars had been lost to both the help and the mill.

This happened after an autumn cold weather spell. It was very warm out of doors. The excessive heat in the mill was attributed to the abnormal conditions outside. Nobody realized that there was a leak in the heating system. But if the temperature and the humidity had been taken and recorded twice daily, this trouble would have been located by any expert manager who was fully alive and interested enough to analyze the situation from reports. For want of a follow-up system this mill lost enough money in one week to pay the salary of a competent manager for one year.

The manufacturing service of a plant is intricate. In fact it is a combination service—an aggregation of various services. It is one succession of services. One service must follow and chase the next one along. No service can be self-centered. A service is dependable upon the one which goes before and the one which follows after it. The various sub-services must work together and become the one great uniform srevice which is called manufacturing.

No matter how dependable a service may be, the surest way to keep it dependable is to have a daily report of that service and then have these daily reports of all services listed each morning alongside or under the previous day's record for comparison. Unless this is done, the value of a daily report can not be truly estimated. It must be compared with the record of yesterday, and the day before. This week's average must be compared with that of the previous week's work. This month with last month. And so on from quarter to quarter, and year to year. In this way, the ups and downs can be compared with the previous high and low places, and the tales become an open book at a glance. The peak loads stand out.

The value of such a system can not be over-estimated when the absolute protection of the vast interest of a plant is taken into consideration.

Touching the various lines of services which make up the manufacturing organization, mention may be made of the chief ones as follows:

Purchasing covers the buying of the raw material, coal, labor and general supplies.

Manufacturing service covers every department and sub-department of the manufacturing division from the bale of raw material to the packing of the finished product. Then follow the various connecting and outlying services necessary to complete the one great service of maintaining everything in the proper order to prevent interruption of the manufacturing. So the manufacturing service is closely followed by the mechanical service, which has to do with the repairs, new construction, power, transmission, lighting, roll covering, etc., as well as lubrication, cleaning and supervisory attention.

Under the heading of inspection comes the day and night watchmen, and periodical inspection of fire equipment, water works, steam plant and transmission equipment.

COMMERCIAL ACETYLENE

EVERY COTTON MILL
SHOULD HAVE A WELDING OUTFIT

You should use the best Acetylene, and COMMERCIAL ACETYLENE, with a uniform purity of 99%, is always dependable. The United States government pays a tribute to this quality in the general use of Commercial Acetylene for all harbor lights, for these lights must not fail, and only acetylene of highest purity and uniformity will serve.

Commercial Acetylene comes in portable cylinders of the following sizes:

10″ x 30″ containing 125 cu. ft.
12″ x 36″ containing 225 cu. ft.
12″ x 44″ containing 275 cu. ft.

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WRITE FOR OUR SERVICE AGREEMENT.

Commercial Acetylene Supply Co.

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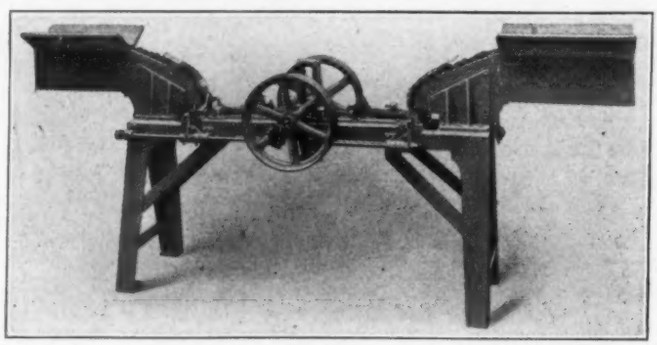
Shipped From ATLANTA

THE DOUBLE END UTSMAN

Cleans Quills all day long and does it rapidly.
Why not investigate?

We also sell "EVERLASTING" Lug Sticks and Picker Sticks which we guarantee fully



The Single End Utsman does just what the Double End does in the same way. It is for smaller mills.

LET US GIVE YOU FULL INFORMATION.

The Terrell Machine Company, Inc.
Charlotte, N. C.

Welfare service will cover the work of the corporation physician, trained nurse, nurseries, play grounds, club rooms, sports, care of tenements and entertainments.

Under selling service will be found price listing, sample making and mailing, drumming, billing and collecting. Then we have shipping, including packing, invoicing and routing: wastes of all kinds; reporting, listing, following-up; bookkeeping, pay rolls, store keeping and correspondence; and finally the executive management and directing force.

The list as given covers only the more important services, but serves well to give an idea of the order of the various services. Under the different divisions, there are many more sub-divisions, and for most of the sub-divisions, there are various other sub-branches. But the whole thing is accomplished by service. It is service from start to finish. If the service is right, all will come out right.

It is the object of this article to give some substantial evidence of the why and how, as well as the benefit of following-up the service. And we will take up a few of the various services at random, so the wise reader can draw his own conclusions.

Take the matter of wastes. All mill men agree that too much waste is made. That it could be reduced. But many of them do not sift the matter down to a system of straightforward following-up. Many mills have found that it pays to have a waste expert who puts his entire time into this end of the business exclusively. This expert knows each day the exact status of the waste end of the plant. He makes it a point to know daily the following: kind of waste made; in what section the waste was made; at what machines it was made; who made the waste; why it was made; how it was made; and the number of pounds made.

When the waste is gathered, it is ticketed and listed. The waste expert passes upon this record. By comparing this list, he can note at a glance whether the same person is making more or less waste. He also compares this person's waste with the lists of the best hands on the same kind of work. In this way he soon gets the mean line of economy. He knows instantly any excesses, and the various hands making excessive waste are shown how to do better. Too much waste may rob an order of being filled, and also prevent prompt delivery.

In the same way, the production service can be followed up. A competent clerk will receive all the production reports and tabulate them. Each machine in the mill is numbered and listed as follows: what stock is run; how many machines on; number of machines run; kind of goods; pounds produced; standard required; and per cent of possible production secured.

By following up the daily production service, the progress of various orders are daily noted, and things are caught that would otherwise get by. For example, by comparing the machines run, with what should have been run, and by comparing the production per machine with the record of the best producers, a line is secured on the production which could not be ascertained in any other way. In this way, a lowered production is self-alarming, and leads the management to find out why the machines are stopped. If all the machines have been running, the management seeks to learn the cause of the lowered production. A great many times these various causes are remedied before another day's work is decimated. The lowered production may be caused by slack belts, loosened pulleys, traffic derangement, needless breaks, waiting for supplies, slow speeds, waiting for help, etc., all of which the management can possibly immediately remedy.

Following up the service of producing (scientifically) by a special production engineer who works for the superintendent, is a vast asset. He must be the superintendent's own right hand assistant who puts his time into this one special job, like the waste man. The advantage of this system is that it brings all things of a kind under one head or specialist without interfering with the superintendent. The waste business from raw material to the finished product comes directly under another head and his workers. Where this is not done, it comes under dozens of other persons less interested and less able to look after it, because of too great a variety of work coming under their care.

And so if the various productions of the mill come under one general head who specializes in production it can be especially followed up. Thus the waste business and production business are automatically cared for, leaving the general superintendent free to devote his entire time to be working only upon the difficulties which need his personal attention, and which possibly he alone can remedy.

The matter of purchasing, storing and keeping track of the supplies is another matter, which comes under another head.

Following up the great and important matter of lubrication: a large plant can well afford a lubricating engineer who has full charge of all the oiling. He will be the chief custodian of all oils and greases, and the oilers. He brings this down to a system. Everything is then oiled more properly, and with much less help and with much less waste.

And then comes the vast and intricate matter of the traffic in a plant. In a large number of plants, the hold-ups, congestions, improper routings, the waitings and the impaired service in consequence thereof, cause a loss which would pay for half a dozen traffic engineers. One man should have entire charge of all the traffic and haulage, and of the landing of the materials wanted at the right place, at the time wanted, in such amounts as is necessary to keep everybody supplied continually.

The same can be said of the transmission engineer. This man will have charge of all belts and see that all are in order and performing properly. This man will have charge of all bandings, belts, main drives, gearings, etc. Under another head comes the lighting service. And other heads for the cleaning service, inspection service and welfare service. Centralizing each of these separate things under separate heads is what counts for giving efficient service.

Included in this unit plan is the power plant unit, roll-covering department, general repairs. The whole principle is to avoid the failures caused by what is everybody's business is nobody's business. Where this system does not exist, taking, for example the matter of belting—without a transmission engineer bossing the job. In this case, every section man in the mill is his own specialist and a law unto himself. Some may be experts and doing well. Many more know no more about a belt than they do about a fiddle string. The simple matter of joining or clamping belts together is of serious importance. The belting wasted. The hooks wasted. The machinery worn out and the power wasted on account of over-tight belts. The pro-

Quality

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is not an experiment. It has been used successfully and in large quantities for over a decade. No other bearing is so efficient for carrying combinations of radial and thrust loads while reducing bearing friction to a minimum.

THE NEW DEPARTURE MFG. CO.,
Bristol, Conn. Detroit, Mich

4-6

New Departure Ball Bearings

duction wasted on account of belts that are too loose or dirty is appalling.

In a large plant there may be several hundred section men, each one caring for several hundred belts. If these men were to specialize only upon the matter of strictly repairing and keeping their machines in order, less men would be required and better work would be done. Instead of having really several hundred belt men under the old order of things, take the new way and with one belt specialist, and one-half dozen men, or less, he can look after all the belts; keeping them clean and in perfect order.

All of the services should be grouped, and each group should be under a follow-up specialist, whose business it is to direct how to have the work done properly at all points. Planning Department. (R.I.)

The North Carolina Textile School which is a department of the North Carolina State College has a larger attendance of students than in any previous year. The United States Government is also making use of this school by sending men who have been discharged from the army. There are at present ten of these rehabilitation men taking special work in textiles.

The total number of textile students at present registered is 158, these being divided in classes as follows: 11 seniors, 24 juniors, 31 sophomores, 74 freshmen, 8 short course, and 10 rehabilitation men. It will be noticed that of this number, 140 students are taking the full four year course.

Swan & Finch Acquire Additional Plants.

Announcement was made recently of the purchase by the Swan & Finch Company of the Cataract Refining and Manufacturing Co., of Buffalo.

The Cataract Company operates large lubricant plants at Buffalo and Chicago, and maintains branch offices and warehouses in eight of the principal cities of this country besides four in England, Scotland and Canada. The increased manufacturing facilities afforded by these will give to the Swan & Finch Company a pre-eminent place in the lubricant field. The retiring company has given particular attention to the development of specialties in grease lubricants, such as cutting compounds, drawing compounds, etc. and practically every recognized form of lubricating grease is included in its line.

Since 1853 the Swan & Finch Company has been one of the leading oil and grease producers of the country. It is the world's largest refiner of Menhaden fish oil. Lubricating oils of all kinds, greases in great variety, semi-liquid oils, and also the numerous vegetable oils are among its products. With the two refineries now operated by this company and the former Cataract plants at Chicago and Buffalo, there will undoubtedly be a production of unlimited capacity. The numerous warehouse stocks strategically situated from coast to coast will insure a service not heretofore possible.

Henry Fletcher, former president of the Swan & Finch Company, is chairman of the board of directors; W. G. Monerieff, formerly president of the Cataract Company, becomes president of the Swan & Finch Company.

Some Dangers of Oil Storage

BY S. D. RICKARD.*

In considering the dangers attendant upon the storage and handling of oils, we are apt to think only of gasoline and naphtha. This is a great mistake, as every oil carries with it a menace to life and property and its handling should be safeguarded in every possible manner. Until this fact is universally recognized and all oils are handled in fire-proof, evaporation-proof steel storage tanks, we must expect to pay an enormous fire loss due to the careless handling of these products. It is true that the danger of handling gasoline is greater than in handling other oils. This danger is so well known, however, that familiarity with it has in many cases induced carelessness, so that it is well that we consider the treacherous nature of this product that we may always be on our guard.

Gasoline, unlike the other heavier petroleum products, throws off an explosive vapor constantly, even at extremely low temperatures. Five gallons of gasoline will generate 8,000 cubic feet of gas, which, when ignited, expands to 4,000 times this space. The explosive force of one gallon of gasoline properly mixed with air and compressed is equal to 83⅓ pounds of dynamite or fourteen times greater than dynamite. This means that if you have 100 gallons of gasoline on hand, you are storing the equivalent in explosive force to 8,366 pounds of dynamite. Gasoline is, in fact, more dangerous to handle than dynamite and there is more liability of an explosion. Dynamite will only explode from two or three causes which may be easily guarded against and which must occur in its immediate vicinity.

The vapor from gasoline is heavier than air. It settles to the floor and runs along the floor much as a stream of water would only that it is an invisible stream. This vapor will settle and remain in a depression in the floor or under the floor for days and even weeks, unless disturbed by a circulation of air, until a spark causes the accumulated vapor to explode. This spark does not necessarily have to come from a lighted fire, but may occur through a person striking a nail in their shoe on a nail in the floor or other similar unavoidable causes. The records show that under certain atmospheric conditions, spontaneous combustion will occur in this accumulated vapor. A case is on record in which the gasoline fumes were carried outside of a building to a lighted lamp thirty feet away from the building, taking fire and flashing back to the building, which was entirely consumed. If you are handling gasoline in any way but the right way, you are in just this position and you can never foresee when the blow will fall.

It is past understanding, in view of these facts, that many concerns, with their entire capital invested in the business, will give so little thought to safeguarding their interests. With the factory, shop, mill or mine heated, they will at night lock up this explosive in a warehouse or building adjacent to or connected with the main plant. After locking up fire and this explosive vapor together, they will, in effect, wager their entire investment against the merely nominal expense of fire-proof storage that this vapor and this fire will not get together.

Kerosene is not as dangerous as gasoline, yet at a temperature of 70 degrees F. or over it throws off an explosive vapor. At a higher temperature, say 80 degrees F., in order to properly ventilate a room in which there is an open tank of kerosene, there should be kept up a circulation of air equal to 200 cubic feet per minute for each gallon of the exposed oil. These figures vary, of course, with the volatility of the oil. Such a circulation of air is not practical in the usual manufacturing establishment. Hence the necessity is apparent for evaporation-proof, scientifically correct storage for kerosene as well as for gasoline.

All petroleum products, including lubricating oils, produce this explosive vapor. The danger from lubricating oils, however, is chiefly from spontaneous combustion where waste, sawdust or shavings are used to absorb the oils spilled on the floors. Many fires in factories and oil rooms have been traced directly to this cause, as it is a very common practice to neglect the accumulated refuse, which in time, bursts into flames.

The gravest danger that confronts the consumer of oils aside from the gasoline danger is, however, from the paint oils, such as linseed oil and turpentine. A piece of cotton waste saturated lightly with equal parts of linseed oil and turpentine will, if left in a closed room, such as an oil house or storeroom for the night, burn from spontaneous combustion in three hours' time. Instances are not even lacking of fires being started in this manner when the waste or oil-soaked cloth was left in the open air. Two years ago a fire occurred in Minneapolis from a cloth which had been used in oiling a floor and was left on the porch. North Dakota has, in the past year suffered a loss running up into hundreds of thousands of dollars from fires started by spontaneous combustion in oil houses. This property loss is appalling, but who can estimate the value of lives sacrificed annually to the mistaken policy of "economy" in equipping an oil room?

We are living in an age of increasing danger to life and property from many causes unknown to our fathers. Development of modern inventions in all lines such as electricity, automobiles, etc., each brings its corresponding danger in life and property. These advances in the development of our civilization bring a responsibility that we cannot ignore. The merchants and the factories today are compelled to meet the conditions. For instance, they are compelled to store large quantities of various dangerous oils. Happily, we are, also, in an age when master minds have set themselves to the problem of minimizing all such dangers. The storage and handling of oils has been reduced to an exact science, so that there are now available means of handling gasoline as safely as spring water.

Special equipment has, also, been designed for handling each and every oil in a manner best suited from the standpoint of economy, convenience and safety. The up-to-date merchant today is taking advantage of these appliances, so that we may in confidence look forward to a time when fires caused by careless handling of oils will be unknown. This will be brought about by various causes. The instinct of self-preservation is strong with everybody, and all must realize the risk in the careless handling of explosives. The fact that these safety appliances conserve the efficiency of the product, preserve the quantity intact and enable losses to be turned into profits brings enormous pressure to bear

*Consulting Engineer, Wayne Oil Tank and Pump Company.

upon the thoughtful man. Public opinion, national and state safety boards, will soon demand that every man will, at least, cease to menace his neighbor's property and his neighbor's life by unnecessarily lax methods in the handling of dangerous explosives.

The increasing prices of all kinds of oil and general economic requirements demand the proper storage and distribution of these liquids. Millions of dollars are lost annually by the deterioration of the quality and waste in handling improperly stored oils. Hot and cut bearings, prematurely worn machinery are very frequently due to deteriorated or contaminated oil. This enormous loss is usually never traced to the right source—poor oil storage. The same criticism can be made of improperly stored paint oils, varnishes, dryers, etc. Competition in practically all lines demands economical production—that means elimination of waste so far as possible in every department of the industry.

Your oils, etc., can be checked in as they are received and accurately recorded as they are used. You can keep just as accurate account of your oils as you can of your tools.

All railroads, mines or manufacturing institutions maintain stockrooms for the purpose of receiving and distributing all of their supplies used by the institution. This is considered absolutely necessary in order to reduce losses and to maintain a cost system.

Money is invested in oils just the same as any other supplies, yet it is a known fact that in most institutions no record is maintained as to the quantities received or dispensed. The purchasing, storing and the distributing of lubricating and paint oils, gasoline, naphtha and other similar liquids is just as much a science and a part of the shop cost system as any other department.

Industrial plants of all kinds, especially railroads, are experimenting continually to learn how the cost of lubricating can be reduced and methods improved, forgetting apparently to investigate the oil house or the storeroom where the oils are stored and issued—the place where the percentage of loss is usually the greatest.

The installation of a modern storage system for oils, etc., need not necessarily imply the outlay of large sums. We have found this "big investment" idea on the part of men in charge of industrial institutions has frequently prevented them from considering the purchase of equipment. It is not always necessary, or even advisable, to put in at one time all the equipment the management might feel would be needed ultimately. In many instances storage is provided for these oil or other liquids which most urgently require it. The balance of the equipment can be added as finances permit or exigencies demand.

Modern storage equipment for handling liquids is really divided into general types. One for handling volatile liquids, such as gasoline, naphtha, paint oils and varnishes and the other for handling non-volatile liquids such as lubricating oils.

The first of the two general types requires underground storage tanks for gasoline or naphtha and above-ground storage for the paint oils and varnishes. This arrangement usually meets with the demands of the various state laws governing this type of storage. Where underground tanks are required they should be cylindrical in design. If made of galvanized steel all seams and rivets should be carefully made and then soldered inside and out. If heavy metal is used much as three-sixteenths steel or heavier weights as to conditions or the capacity of the tank may make necessary, then all seams and rivets should be carefully caulked. Storage tanks for volatile liquids require special care in construction. A tank may hold water or steam pressure but it is usually unfit for volatile liquid storage purposes.

If above-ground tanks are essential these are made in rectangular shapes, the height and length remaining constant and the width varying according to capacity desired. This arrangement permits the addition of other individual units to the system and does not destroy the uniformity of the battery of storage equipment. Rectangular tanks are made with the same care as the cylindrical designs.

Specially designed pumps of either measuring or non-measuring type are connected by pipe lines to tanks buried underground or inserted in the top of tanks for above-ground use. Accurate devices are provided on the measuring pumps for the delivery of desired quantities of liquid. Gear driven meters may be added for the purpose of checking consumption. Locks are supplied on both types of tanks and on the pumps as well. This prevents unauthorized usage and theft.

Where a battery of individual units is used a barrel track and barrel drainers are used in connection with small chain hoists. This makes it very easy to handle the barrels and drain them completely into the manhole of the tanks. This saves labor, time and liquid and prevents the loss of liquid due to the return of liquid in barrels which have not been properly drained by the old style spigot method. Dirt, dust and sediment are kept from the liquids, fire danger is entirely eliminated, valuable storage space is saved, labor is lessened, cost and consumption are easily arrived at.

Alvin Lovingood, president and treasurer of The Lovingood Company, of Atlanta, southern representatives for a number of well-known manufacturers of shipping-room supplies, recently returned from an extended trip east.

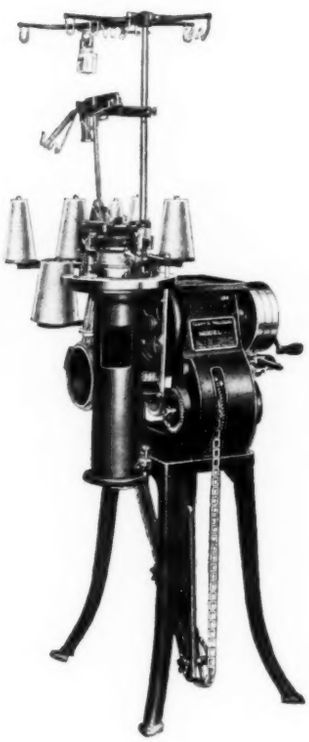
Mr. Lovingood announces that he has secured better shipping facilities from his several companies, and that he will in the future be able to supply goods very promptly, direct from his warehouse to any part of the southeast.

New York, Jersey City, Boston, Holyoke and Pittsburgh were visited by Mr. Lovingood, wherein the home offices of several of the concerns represented by his company are located, and he reports that all of them were more than pleased with the result of business obtained in the southeast.

He also announces that he has secured the exclusive southern rights to the Revolvator portable elevator, manufactured by the Revolvator Company. This machine is used for lifting heavy loads and stacking them to any height desired, thereby enabling a manufacturer or jobber to utilize much more of his warehouse space. This machine will be shortly added to the local warehouse of the Lovingood Company, to be supplied to the trade in the southeast directly from Atlanta.

Mr. Lovingood said that all of the manufacturers were more than pleased with the advertising results that had been obtained, and said that several of them were figuring now upon an advertising campaign for next year in the southeast, as they realized that the field has hardly been touched, and that a big opportunity awaits them here.

KNITTING SECTION



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With automatic means for preparing the machine for transfer, require less moves on the part of the operator. This means increased production and lower cost.

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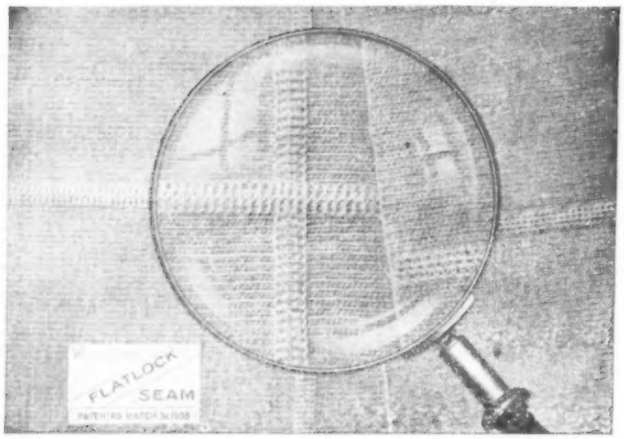
"The Seam That Sells the Garment"



An absolutely flat seam.
A locked seam
A strong seam
An elastic seam
A thin seam
A friendly seam
An ornamental seam

(Illustration shows you its construction)

So many lines of knit underwear are being manufactured that the experienced buyer in picking the wheat from the chaff chooses a line that is made with the *Flatlock* Seam.

There must be a reason. The *Flatlock* Seam is the best Seam in the world because it has the points of superiority noted at the left.

The *Flatlock* Seam is a selling feature that manufacturer, wholesaler, jobber and retailer can use---one that the retail customer will appreciate if rightly emphasized.

We are proud of the *Flatlock* Seam and justly so, being sustained by the knowledge that nearly 300 manufacturers in the United States, Great Britain and Canada are using the *Flatlock* Seam in the manufacture of their trade-marked lines.

Unless you are already using *Flatlock* machines, you should investigate their merits.

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Trade Mark

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The Knit Goods Market

A revival in the knit goods market such as the trade was illy prepared for, although not wholly unexpected, set in during the early days of November, and what followed has more than fulfilled all predictions of a rise in prices. Buying started with a leap, and has continued in very large volume, notably in underwear. In no month before, during or since the European war, was there ever recorded such sharp advances in hosiery.

Apparently buyers had their ears to the ground and at last woke up to the fact that good merchandise would be scarce and that values were certain to go higher. They gave up, doggedly enough at first, resistance of the inevitable, and fairly swamped underwear mills with orders, and what is of greater significance, were glad enough, in many instances, to place orders at open prices, and many eagerly committed themselves for heavy weight garments for the winter of 1920-21. That was before any of the mills, with few exceptions, had opened their lines for next year. Since then some new high prices have been named, but they are not deterrent to the making of staples for deliveries up to June 30 next.

As illustrating the interest in woolens in particular, blankets were bought freely from one concern, which came upon the market in advance of the opening by the American Woolen Company, orders calling for deliveries in January. Transactions of this character are held as evidence of confidence in market stability even beyond the first half of 1920.

It is noteworthy that while woolen and worsted sweater lines were opened early in November for fall 1920 at prices from 25 to 40 per cent higher than ruled last January, when garments now in the retail stores were being offered by mills, orders are being placed in fairly good volume. Deliveries of initial orders will be completed by July, unless interrupted by labor shortage, but many mills will deliver as fast as finished, usually on regular terms. Some will permit deferred datings, a practice that is regarded extra hazardous.

Sweater manufacturers are gravely concerned over worsted yarns, which are going to levels calling for extreme caution. Deliveries of 40s 2-ply are being made against old orders at $2.50, while $3.75 to $4 is heard for the coming season. Quarter blood 30s 2-ply, going out under contracts of some months ago at $1.85, will be a dollar higher.

It is asserted that manufacturers have forced prices up by bidding against others, scarcity driving mills to almost any extreme to obtain yarns. The tail end of the season found spinners from four to eight weeks behind in deliveries making it appear that the prices mentioned for next year will be readily obtainable.

An inquiry accompanied by specifications came from Australia for a large quantity of woolen yarn, but interested few if any spinners.

The situation in woolen and worsted yarns is regarded as assurance that the lowest priced sweaters distributed next year will be bought early, and the same probably is true of woolen and worsted underwear.

Hosiery throughout November enjoyed a spurt not unlike that of July, interest increasing with advances in yarns. When single carded reached a few cents above the war-time maximum fixed by the War Industries Board there developed a rush for the finer gauge stockings, in carded, combed peeler and mercerized, and by the time the flood gates were opened, letting loose rafts of orders, manufacturers found it necessary to make radically higher prices to meet the sharp increase in yarn costs.

Hosiery price advances in the first three weeks of November were greater than in any month before, during or since the war, to which fact, a number of buyers report the merchandise man in the respective jobbing houses is even now not fully awake, putting up stout resistance to increases in buyers' budgets for the coming year. One jobber, taking fifteen numbers of cotton and mercerized hosiery, finds that the advances have averaged more than 52 per cent since December, 1918.

Mercerized hosiery, for men and women, went to new high levels early in November, but the records for the first week have been shattered several times. A woman's full mercerized, made in a Pennsylvania mill, was priced at $6 a dozen for January, February and March deliveries. In less than three weeks the price was advanced to $7.25. Business at $6 was offered, but when the mill sought to cover for 60s 2-ply mercerized yarn the best quotation given was $3.56 a pound. This manufacturer will make up no hosiery from yarn at that price unless jobbers will be willing to pay him $7.25 a dozen. The management figures that it were better to sell for spot, from yarn coming in against contracts placed several months ago. As a matter of fact, holders of such yarn could fare handsomely by selling it at today's price, and would be about as well off at the end of the season if they sold hosiery at replacement value only so far as they are covered by old contracts.

A few weeks ago women's mercerized stockings in second hands were obtainable at $4.50 a dozen. For several months mercerized lines were singularly draggy, even in the rising yarn market. But there came a time when low-price supplies were exhausted, and then every jobber wanted them, still haggling over the price, however. Now mercerized stockings are second to silks in demand. Either the dealers will have to be content with a less per centum of profit, or women's mercerized stockings will sell in retail stores at $1.25. The large profit is not for the mill. Mercerized stockings already are about the price of full fashioned silk a few years ago.

A Pennsylvania mill making women's full mercerized 220 needle stockings, mock fashion, weighing about a pound and a half per dozen, has orders at $6.75 for immediate and is naming $7.50 for January delivery. While the stocking carries no features, it is understood to be made from yarn prepared to certain specifications. The line for some time has been selling above the market for 220 needle mercerized of the usual types.

A Philadelphia jobber was quoted $5 a dozen for mercerized seamless half hose, but did not buy. A southern manufacturer, however, shows firm orders at $4.85 for plain and another is quoting $5. Prices of mercerized half hose have advanced fully one dollar a dozen since September, when jobbers were not interested. Mills at that time could have covered for yarns at prices that would have kept half hose down around $4.25.

A manufacturer hitherto making silk half hose has dis-

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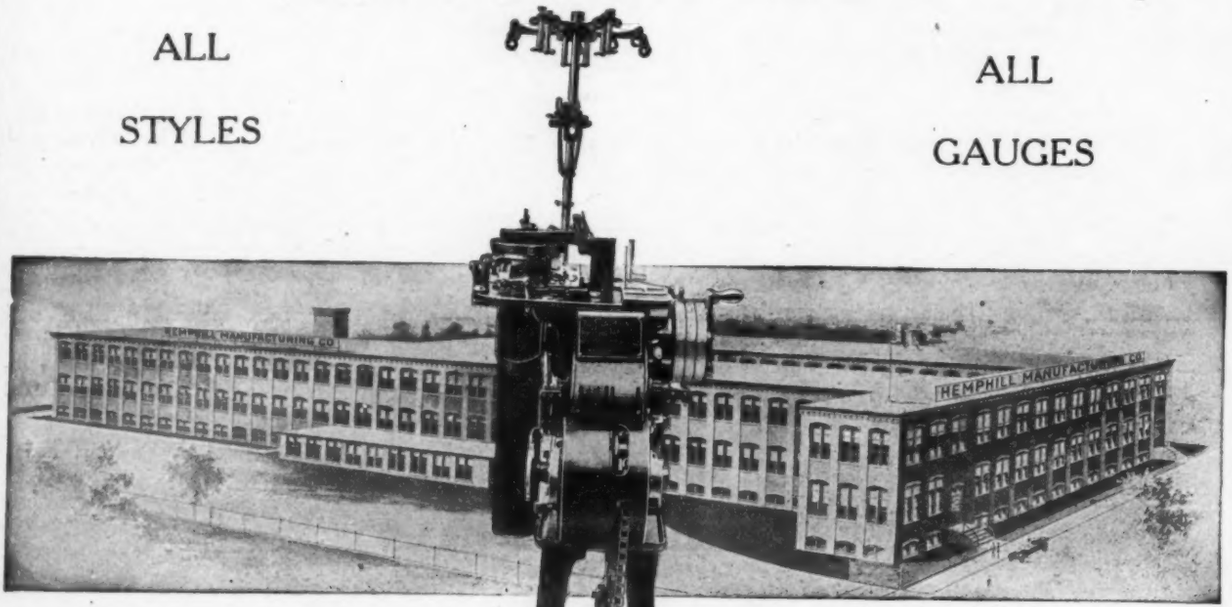
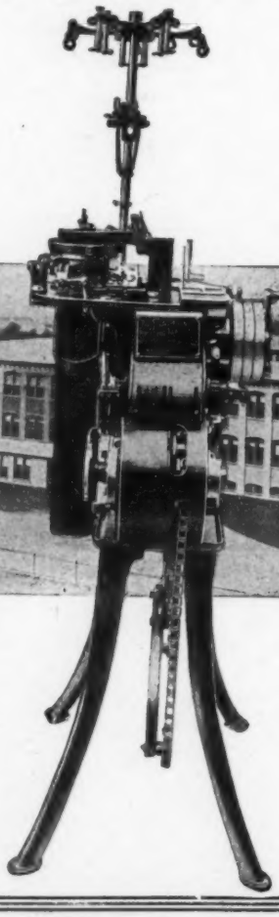
ALL STYLES

ALL GAUGES





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continued his line, and is using silk only for plating on mercerized, producing an attractive and durable sock. The change was made because of a very acute shortage of hosiery silk and is in conformity with the policy of some of the distributors of knitting silk. These distributors have gone so far as to curtail allotments to manufacturers of commodities consuming silk in very large quantity. For illustration, it is easier for a manufacturer of knitted neckwear—silk and mercerized in combination—to obtain more nearly his requirements than it is for the weaver of cut silk for neckwear purposes.

Women's full fashioned silks—$7 to $7.50 in 1916—are being eagerly taken at more than three times these figures. A line of ladies' all silk hosiery is held for $40 a dozen for next year. Women's seamless silk, with the fashioned effect, are readily salable at $17 to $22 a dozen, depending on the length of boot and whether of 10 or 12 strand silk. Manufacturers have been known to pay as high as $18.50 a pound for hosiery silk, this including a premium for spot delivery.

Prices of hosiery for 1920 seem almost unbelievable. A line of half hose which sold in retail stores a year ago at one dollar a pair will go to three times that figure. Of course there still is a few cheap silks—rejects. A considerable quantity of ladies', selling to jobbers at $20 a dozen, was rejected recently because of imperfect looping, and was thrown on a commercial looper, whose only escape from a very serious loss was by selling as is. This is one explanation for comparatively low priced silk stockings occasionally advertised by department stores.

High prices and scarcity of silk forced buying of mercerized lines, and the new level of the latter is forcing greater values for combed and carded stockings.

But hosiery has not moved up apace with mercerized yarns. On May 9 last, a mill paid $1.35 a pound for 70s 2-ply. On November 17 the mill was quoted $4.50, the highest price then heard for this count. The advance of $3.15 is greater than the jump in hosiery, in the manufacture of which there has been increased operating cost, so that it is shown that hosiery manufacturers still are under spinners and mercerizers.

A combed yarn sock is priced $3.35, deliveries to be completed this side of March 1. These figures are given by a mill which quotes a line of misses' ribs, double carded yarn, 300 needle, at $3.45, although one mill has been selling its misses' combed peeler, 320 needle, at $3.50, to jobbers.

Following are prices obtained on three lines since November 18: Women's full fashioned lisle, $15; women's 200 needle carded, made from eastern 10s quoted at 80 cents, $2.85; misses' fine ribs, carded, $3.45, rise 10 cents, fall five.

A fine gauge combed sock that was refused by jobbers on the ground of alleged too high price has been marked $3.55, which is 30 cents above what they might have bought for some weeks ago.

Two mills making 176 needle socks are out of the market and will offer nothing until after January 1. This type of stocking of not strictly high grade is being offered as low as $1.65, while standard goods have been selling around $1.75, special grades going at $1.85.

A southern mill which had been specializing in very low-price 176 needle socks has turned most of the machinery over to ladies' 176 needle, and is selling in foreign markets, at $1.80 for 24-ounce, cut toe. This is 10 cents under a quotation on the same gauge, 20-ounce, for domestic account.

A sale of 24-ounce 176 needle half hose amounting to $10.000 was made for export, and the same interests sold 5,000 dozens of 144 needle socks for foreign account. There was some difficulty in obtaining the latter at a price satisfactory to the local agent of the foreign house, at least two mills declining the business at $1.35 for sewed toe, bundled. One export inquiry recently floating about is said to have related to 30,000 dozen of 144 needle socks.

An establishment handling the output of several southern mills reports a lively demand for seconds in low end socks, for a two-for-a-quarter proposition in retail stores. Finer goods in seconds, men's and women's, to retail at 25 cents, are also wanted. Seconds in 300 needle misses' combed are reported having been sold at $2.40.

A western mill which opened its line of workmen's 3-pound mixed cotton socks on November 1 at $1.85, is overwhelmed with business and already finds it necessary to scale orders.

Two-pound wool socks for next fall have been on the market for several weeks, the house in particular booking volume business. It is understood they are going to jobbers at a price that will enable retailers to sell them at 50 cents.

Sales of misses' mercerized have been made at $5.75, for January and February, rise 25 cents, fall 15. A mill selling at the same figure and same rise, grants a fall of 12½ cents. A job lot of misses' sold recently at considerably under the prices mentioned.

Misses' fine carded ribs have climbed to $3.35 and combed to $3.50. The 28-ounce have been sold at $2.25, and one mill proposes an advance of 10 cents a dozen to go into effect early in December. This mill names a rise and fall of five cents. A lot of the 28-ounce ribs were bought quite recently at $2, but this was a sale of the character that does not establish a price. Mills which have named the higher prices mentioned are adhering to them, sale or no sale.

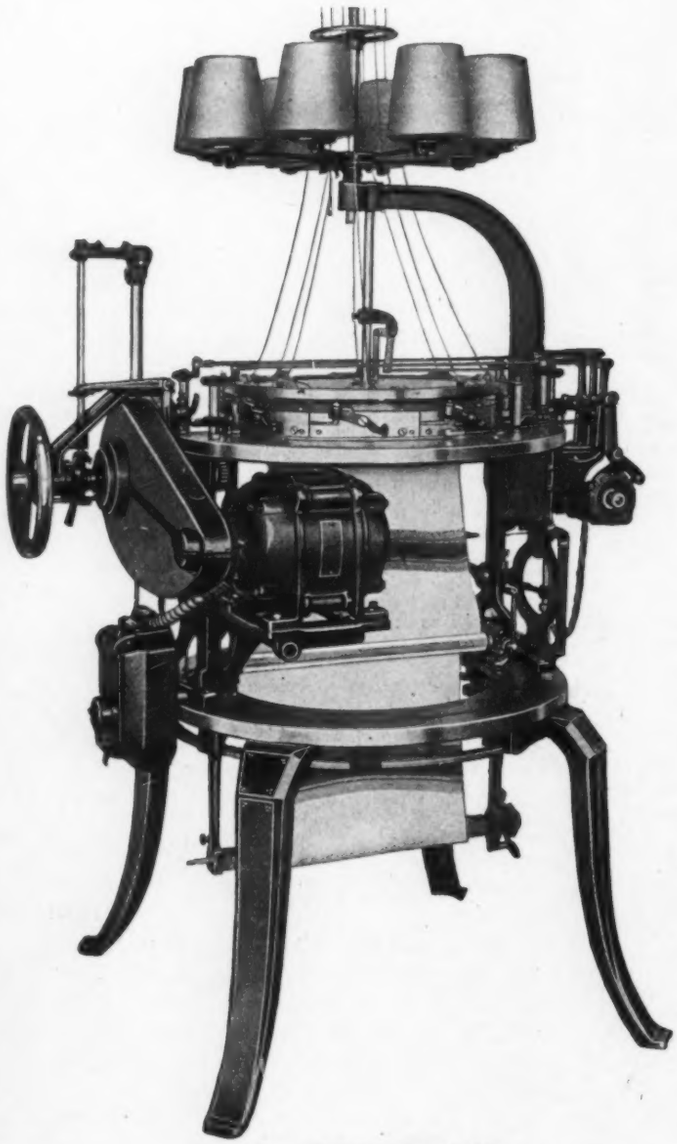
An advance of 25 cents for ladies' 220 needle combed is announced by a mill, whose price now is $3.50 for the mock fashion.

During the October quietness in hosiery a scared or impatient manufacturer went among jobbers offering any portion of a lot of 18,000 dozens of hosiery selling freely at and above $3, naming a price of $2.65. Some jobbers refused to believe the goods would come through as represented either as to quality or delivery, and consequently took none. One distributor, however, bought 6,000 dozens for nearby delivery. The stocking will command $3.35 today. This transaction is one of many that may be cited for showing the profits that sometimes are handed over to the trade by not well informed or easily frightened manufacturers.

Business in underwear for fall 1920 is in full swing, the highest priced garments ever sold being taken by many jobbers, while others are exploring the market for openings at under prevailing levels.

It is noteworthy that most of the jobbers who affect to be not in the market are sticking close to sellers, trying to pry loose merchandise for starting them in next year's campaign. Meanwhile, it is discerned, they are busily en-

Wildman Motor Drive



Drive on Bathing Suit Machine
Back View.

Look this drive over, and then go out in your knitting room and form a mental picture of how it would look if all the machines were equipped with Individual Motors. Dangerous belts and unsightly line shafts done away with, bettering the light and adding to the convenience of the knitting department.

But the improved appearance of the knitting room is not the only advantage. The motor drive increases the production of the machines 10 to 15%, as the loss due to belt slippage is entirely done away with.

The drive can be attached to a Wildman Belt Driven Machine in a half hour's time, by simply taking out the old side and slipping in the new drive complete. No drilling or tapping is necessary.

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gaged spreading bear propaganda, but with little comfort to themselves and no disturbance among sellers.

These buyers contend that cotton underwear more particularly has gone to scandalous prices. "We simply cannot finance our business for next fall," said a St. Louis buyer. "Manufacturers appear not to realize what it means to us to go out and buy underwear, cotton and woolen, and carry it for the retail trade. And few retailers will be able to take the merchandise in during the early part of the year."

This particular jobber said, and others are saying the same thing, that at last the consumer is haggling over price and vowing he or she will do more mending, and less buying. Assertions of this character run so nearly uniform that it is coming to be suspected they may have been molded in an informal conference. Reports from merchandising centers do not bear out these bearish jobbers.

Several of the larger Chicago jobbers got into the market early for next year's heavy weights and have bought in good volume. St. Louis is doing a little in woolen garments, but has bought liberally of cottons. The South is beginning to do business in both, and Boston is coming along at a pace to indicate interest in New England.

Some of the western mills which have sold fairly good orders for January and February, have not named prices for later months. When they do, the figures, it is predicted, will be above those of the opening, which went off with a boom such as had not been seen in a number of years. A few jobbers ascribe the heavy buying to what they represent as a fact, that such buyers are ordering about twice what they really believe they will require, fearful that orders will be halved. This seems not unlikely, and if there is such a feeling among any considerable number of buyers it but emphasizes the stand of manufacturers that underwear will be scarce before buyers have completed their purchases. No matter how much the bear element wriggles, they are unable to extract consolation for a condition that no body of manufacturers can remedy.

At least one mill making woolen underwear is sold up tight for the entire year 1920, and two others are off the market, doubtless prepared to return with new price schedules as the buying season advances and finds merchandise in prospective shorter supply than at present. In several instances lines were sold up within a week. Prices in some lines are already slightly above those of the opening. For example, fleeced shirts and drawers that opened on November 10 at $11 now are $11.50, and a union suit fleeced, which sold on November 10 at $19.50 has been advanced to $21.50. Both are of a well known line, and the prices named are for early deliveries.

The High Rock Knitting Co., Philmont, N. Y., fleeced underwear, is selling at the following prices: Shirts and drawers, $11.50 for 13-pound; $12.50 for 14-pound, and $13.25 for its Random brand, also 14-pound; union suits, $20 for 20-pound and $21.50 and $22.50, respectively, for the Red Label and Random brands, both 21-pound. In its announcement to the trade, stating these prices, the company says: "Prices are for only three months' production for equal deliveries. January, February and March, as nearly as possible, terms 60 days, to be anticipated at 6 per cent per annum. Increasing costs of materials now under negotiation and expected advances in labor cost due to reduced running time will probably show an advance over and above quotations of 2½ to 5 per cent."

A line of southern-made cotton shirts and drawers, sold at $3.62½ a dozen when prices maintained a normal range, is going to jobbers at $10.50, and union suits, formerly $6 a dozen, now are selling at $18, as is disclosed in the prices recently announced by the mill, as follows: 10-pound single garments, $10.25, and 11-pound $10.50, for January to March delivery, increasing 25 cents per dozen for each succeeding three months period; 16-pound unions suits, $18, increasing 50 cents per dozen for April, May and June and an additional 25 cents for July, August and September.

The retail group of underwear mills—those selling direct to the retail trade—will have a meeting December 17 to decide finally on an opening date. The matter was discussed at a recent conference, but manufacturers arrived at no general understanding, some expressing a preference for about January 15, others being inclined to postpone the formal opening to February. In the meantime, it is expected, the mills will enter the orders of customers who insist on getting in early; in fact, it is understood some of the retail group mills already have booked business for next fall.

Underwear to be sold over the retail counter in 1920-21 will cost fully one-fourth more than was paid for that on the shelves of retail stores now, it is stated by a number of manufacturers.

When winter underwear lines were opened in January last by mills selling the retail trade, manufacturers were paying around 43 cents for cotton yarn, basis of southern frame spun 10s single, against 68 to 70 cents today, and were getting a better production in dozens per day.

The ladies' vests of an eastern mill selling the retail trade, which opened for the current season at $8.25, have been priced $11.25; ladies' union suits from the same mill are to go on the market at $19.25, an increase of $4, and merino vests, which sold in January at $14.75, are marked $20. These prices will hold only for manufactures against yarns already contracted for. When yarns for which the mill has covered have been consumed prices will undergo a further advance of at least 10 per cent, assuming the yarn market shows no recession, it is stated at the mill.

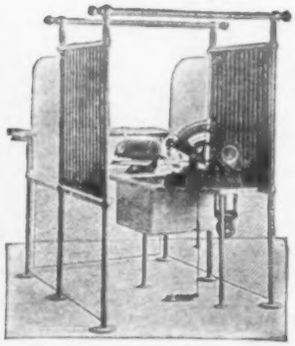
Men's balbriggan shirts and drawers, which soon after the armistice slumped off to $3.37½ and even lower, to jobbers, are commanding $5.50 for a popular make. The 25-cent garment of pre-war days seems destined to sell in retail stores at 87 cents to one dollar, and the ribbed garments which were a popular 50-cent seller, now going over the counter at one dollar, will have to fetch from $1.25 to $1.50, according to manufacturers who have been figuring costs.

Sweaters, according to leading operators in these garments, have been sold in sufficient volume since the opening for fall 1920 to establish jobbers' acceptance of prices by 25 to 40 per cent than when lines were opened in January last for the current season. Several manufacturers have asserted they could sell twice their production, which promises to be not more than 65 per cent of normal. Some lines are reported having been opened and closed within two weeks, and there are instances of withdrawal after two days of selling. A difference of $10 to $12 a dozen appears to not affect many jobbers, amounting, they point out, to only $1.25 to $1.50 more per garment for the consumer. Some of the more popular lines have undergone price advances since the opening—after selling less than two weeks.

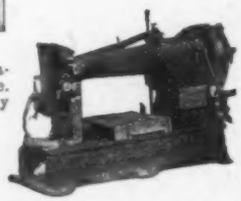
With the buying well under way, mills have had a good

The "National" Booth System—

Here are the Various Units That Comprise This System

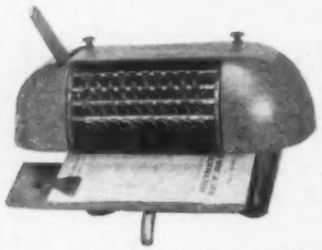


No. 1—The National Metal Booth arranged with the National Lang Counting and List Printing Machine and the No. 8 National Power Marking Machine.



No. 2—Improved No. 8 National Power Marking Machine. Marks all classes of laundry work.

No. 3—The Rose Label, Tape and Patch Sewing Machine sews previously marked identification tags to garments that cannot, or should not be marked direct.



No. 4—The National Lang Counting and List Printing Machine counts and lists in one operation.

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Proper Identification of Every Article Sent to the Laundry is Assured.

Your Mill Village Laundry will be the success you hope for because the National Booth System gives you —and your employees—assurance **every article sent will be returned.** The legible, correct marking and handling of every piece **eliminates lost articles.**

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The markers are separated; each in her individual booth. There's positively no confusion in the marking department. All work can be handled with the minimum number of movements, with but ONE HANDLING of each piece and no cross-overs.

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start and, unless labor fails to do its part, should be able to turn off more sweaters than were produced for the present season. This will be necessary, as there are no carry-over stocks, and it is expected demand will continue strong. Indications point and for some time have pointed to an enormous business in sweaters in 1920.

The German Situation As Seen by an American Business Man.

Germany will not be able for a long time to make herself felt as a competitor in knit goods, according to a person prominently identified with a Philadelphia textile mill who recently returned from Berlin and Chemnitz, in each of which cities he spent some time on business. The rate of exchange places her at a disadvantage in buying raw material, and there is a labor condition that militates against a return to industrial normality. Although a workday is of eight hours—four hours on Saturday—there appears to be lacking ambition to do all that might be done. Perhaps this might be ascribed to the fact that the people of Germany are barely half fed. They are rationed as to meat and a number of food stuffs and must pay high prices for the little that they are permitted to buy. But that Germany will get on her feet by means of the bartering with border countries that is going on, eliminating the use of money, is the opinion of the returned business man.

In Holland, this person says, warehouses are so filled with American cotton that it would be difficult to find room for more. It is suspected that much of this cotton is intended for German manufacture on the barter basis, and that by easy stages there will be restored normal activity in the textile mills. During this person's stay in Germany several business men were there completing negotiations for the shipment of raw materials into the industrial centers to be worked into finished products and shipped for the markets of the United States. By shrewd manipulation of exchange, it is stated, this can be made profitable, and the suggestion was ventured that this yarn will come back, landed on American docks, at prices lower than those which prevail in domestic yarn markets. It is pointed out that England would not be averse to supplying Germany with yarn to be made into knit goods—not for English markets, but for export to her colonies and transatlantic countries. French business men are said to have been in Germany the day after the armistice was signed, ready to transact business with German exporters and importers, and Englishmen followed soon after.

It is strongly intimated that the buyers for two of the leading wholesale dry goods houses of the Central West who a month or six weeks ago were in Germany to buy hosiery, for distribution in this country (they are quoted as saying), went prepared to finance German manufacturers of hosiery, in other words, supplying either yarn or cotton. It is by only some such method, it is said, that knit goods made in Germany can be obtained for the markets of this country. Germany enjoys an advantage in her lower wage rates, a machine fixer, for illustration, being paid four marks per hour.

Germany is conserving what remains of her wealth. An alien entering that country is not permitted to take out more money than he brought in. He is halted at the border and required to hand over to an official all of his funds except so much as will be needed for completion of the journey, says the returned business man. He is given a receipt for the sum of his deposit with the government official, and upon arrival of the city of destination he may draw against it.

American money, converted into marks, it is stated, will buy more of most commodities in Germany than could be purchased in England with the same amount converted into sterling. At the best hotels the rate is from 38 to 40 marks per day for a room in Berlin and 28 marks in Chemnitz. A breakfast such as may be had in Berlin for about ten marks would cost two dollars in Philadelphia, said the textile man, who is a frequenter of the fashionable clubs. For a five course luncheon he paid 20 marks, but the cigarettes accompanying cost him the equivalent of ten cents apiece in American money, and no one is permitted to buy more than two at any meal. A pair of ladies' full fashioned silk stockings costs 30 marks.

Germany is so short of coal that the operation of the railroads must be conducted on the most economical basis possible. Very few trains are run and these are not ample for the accommodation of travelers. Such a thing as a Pullman is unheard of. The textile man stood nine hours during a journey of 23 hours.

Visitors to Germany are permitted to live more luxuriously in the matter of food than are the residents, who still can obtain bread and meat only on presentation of tickets purchased from the food controller. There may be a reason for making life attractive to visitors, particularly those who enter the country on business missions. Of the United States business men in Berlin during the stay of the Philadelphian, those from the South were conspicuous for numbers, and it was the belief that arrangements were being made whereby German mills would be supplied with cotton to be spun into yarn, the process to be paid for in cotton. It is understood here that several American consumers of woolen and worsted yarns have had very flattering offers from Germany for the spinning of the yarn in exchange for wool and tops. Dolls and toys have been bought in Germany for a Philadelphia department store, it is stated by the returned business man, and it is his impression, and of others who recently have visited Germany on a business errand, that textile products are certain to follow. But there is nothing encouraging for Germany as to her immediate foreign trade, according to a translation from a Finnish journal transmitted by an American consul at Copenhagen, which says German manufacturers and merchants themselves are not optimistic.

Preliminary arrangements are being made for the next annual Knitting Arts Exhibition which will be held in Philadelphia in connection with the 16th annual convention of the National Association of Hosiery & Underwear Manufacturers. This convention will be held during the week of April 26-30, 1920. No decision has as yet been reached as to the place for holding the exhibition, but efforts will be made to secure centrally located quarters which will be easily accessible to the members. The selection will also be largely determined by the demand for exhibition space. Therefore, efforts are being made to secure early reservations from those who have been accustomed to participate in the exhibition. Many of the larger exhibitors have already signified their intention to occupy larger space.

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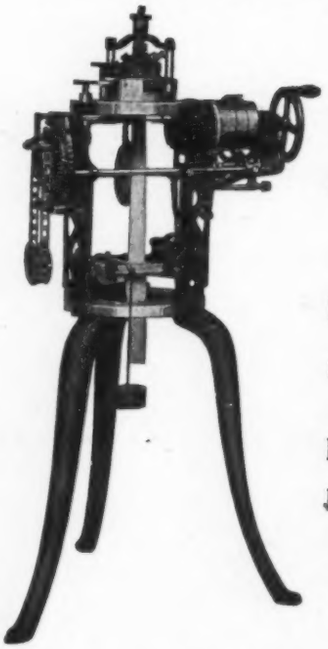

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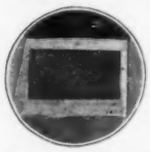

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Terms for attaching holders on application.

The features of this holder are:

It secures a uniform length;
No disfigurement of goods;
Greatly improves the finish of the product;
Makes less work for pairers;
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Paramount Forms increase the selling value of your merchandise, and in addition make a large saving in labor, steam, floor-space and improve factory conditions.

Your have the option of the three following plans for installing Paramount Drying and Shaping Forms: (1) A flat monthly rental; (2) a per hundred dozen rental; (3) to purchase the forms.

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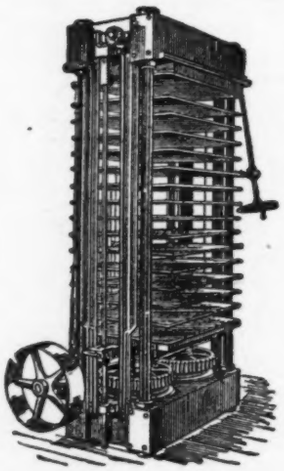

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Hot Plate Screw Press

FOR

Hosiery and Underwear

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Reliance Machine Works

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Among the Knitting Mills

The Meldor Knitting Company, Lititz, Pa., has recently filed articles of incorporation with a capital of $50,000 to operate a local plant for the manufacture of knit goods of various kinds. H. E. Gingrich, Mount, Penn., is the principal incorporator.

The Nolde & Horst Company, Reading, Pa., manufacturers of hosiery, has recently awarded a contract for the erection of a new addition to its plant for increased capacity. The structure will be five-story, about 100 x 110 feet, and is estimated to cost $92,000. George D. Horst is president.

The American Mills Company, Hamden, Conn., specializing in the production of elastic and non-elastic webs, is making rapid progress on the construction of a new one-story brick addition to its plant, about 78 x 135 feet, estimated to cost $45,000. The Sperry Engineering Company, 82 Church Street, New Haven, is the building contractor.

The Threebe Knitting Mills, Brooklyn, N. Y., have been incorporated with a capital of $20,000 to manufacture knit goods. Samuel L. Bach, C. M. Buchanan, and L. M. Bernstein are the incorporators.

Arrangements are being made by the Hildebrand Hosiery Company, 1720 Hanover Street, Allentown, Pa., for the construction of a large new stack at its plant in the Rittersville district, to be used for increased power purposes.

E. Sutro & Son Company, East Thompson and Clearfield Streets, Philadelphia, Pa., manufacturers of hosiery, will build a new one-story brick extension to its mill at Fifty-fourth and Paschall Avenue, to facilitate operations.

The Classic Hosiery Company, Reading Pa., has filed articles of incorporation with a capital of $25,000 to operate a local plant for the manufacture of hosiery. F. E. Guenther and R. K. and A. L. Bodenhorn, 858 Penn Street, are the incorporators.

The Hawthorne Hosiery Company, Hawthorne, N. J., has been incorporated with a capital of $50,000 to manufacture hosiery, knit goods, etc. Louis F. Mueller, Theodore Landis, and Paul E. Rauschenbach, Paterson; and Gustave A. Scheller, Haledon, are the incorporators.

The New England Hosiery Manufacturing Company, Fall River, Mass., recently organized, has perfected arrangements for the operation of a mill at 32 Wooley Street for the production of hosiery. The company has completed the installation of four Banner machines, four loopers, four ribbers, 14 Scott and Williams machines, and auxiliary equipment. J. M. Ashworth and D. R. Remick head the new organization.

The Chester Knitting Mill Company, Chicago, Ill., has recently completed negotiations for the purchase of a building at Millstadt, and is planning for the installation of equipment for a new branch establishment. It is proposed to have the mill in operation early during the coming month.

The L. K. Hosiery Company, Utica, N. Y., has been incorporated with a capital of $15,000 to engage in the manufacture of hosiery, underwear, and other knit specialties. L. K. Lindsey, A. V. Kranz, and H. S. Hoffman are the incorporators.

The Green-Haas-Schwartz Company, Chicago, Ill., has recently completed arrangements for the acquirement of property at 105th Street and Elk Avenue, to be used as a site for the construction of a large new knitting mill. The proposed works will be three-story, about 165 x 290 feet, and are estimated to cost in excess of $500,000, including equipment installation.

The Windsor Knitting Mills, Greencastle, Pa., have recently completed the removal of their plant to a large new building formerly held by the Emmerson-Brantingham Company. It is understood that the new owner is considering plans for the installation of 50 additional machines, to provide for increased capacity.

The Portage (Wis.) Underwear Company, manufacturer of underwear, etc., has recently completed negotiations for the acquirement of the Hyland Building, and has arranged plans for extensive alterations and improvements to meet its requirements preparatory to the installation of knitting machinery.

The Regal Knitting Company, New York, has been incorporated with a capital of $15,000 to manufacture knit goods. George S. Fulton, New Rochelle; Jacob Berman, and T. Epstein, 21 West 118th Street, New York, are the incorporators.

Notice of organization has been filed by the Art Knitting Mills, Newark, N. J., to operate at 383-85 Halsey Street, for the production of knit goods. Adolph Knefely, 126 Court Street, and Adolph Dieterle, 210 Van Buren Street, head the company.

The Van Dyke Knitting Company, 888 Pierce Street, Milwaukee, Wis., has taken bids for the erection of a new four-story brick and concrete mill addition to its plant, about 41 x 70 feet, estimated to cost $30,000.

Arrangements have been completed by the W. A. Lawrence Company, Inc., Poughkeepsie, N. Y., manufacturer of knitted mesh fabrics, etc., for the construction of a new addition to its plant, about 60 x 80 feet. The structure is estimated to cost about $60,000.

The Peerless Knitting Mills, 77 Summer Street, Boston, Mass., with a plant at Mattapan, Mass., have awarded contract for the construction of a proposed new three-story mill, about 50 x 70 feet, to be located at Barre, Vt. R. Scott is president; A. P. Lane, Barre, is the contractor.

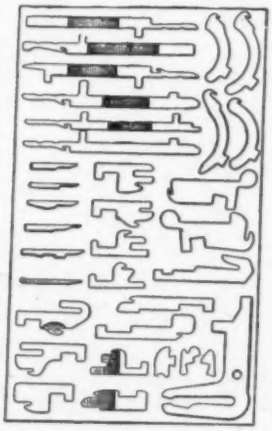
The Hancock Yarn Mills, Philadelphia, Pa., have been incorporated with a capital stock of $28,000 to manufacture cotton and woolen goods, yarns, tops and textile fabrics of all kinds. The incorporators are Leo C. and Oliver Safir, and E. M. Tisdall.

The Blue Star Knitting Mills have been incorporated at Milwaukee, Wis., with a capital stock of $130,000. The incorporators include Max Breslauer and Nathan Pereles, Jr.

A charter was filed recently at Dover, Del., by H. R. Mallison & Co., Inc., the capital being $30,000,000, to manufacture silk goods and textile fabrics of all kinds. Harry McDaniel, Jr., and Arthur J. Kingsbury, are included in the list of incorporators.

It is reported that the Roxboro Hosiery Mill, 2011 East Arizona Street, Philadelphia, has gone out of business, the building and equipment having been sold.

Edward Noon & Sons, Philadelphia, manufacturers of bathing suits and fancy knit goods, have applied for a char-



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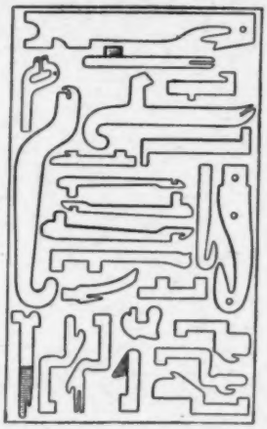

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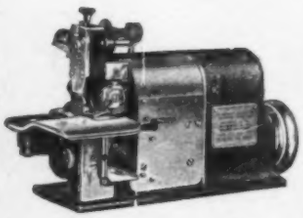

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ter. The new firm will operate under the name of Edward Noon & Son, Inc.

Edward N. Conkling, with offices in the Stephen Girard Building, Philadelphia, is starting a mill at 1825 Bristol Street, Germantown, Philadelphia, for the purpose of manufacturing seamless cotton hosiery.

The Washington Hosiery Mills Co., a new enterprise incorporated with a capital stock of $100,000 at Nashville, Tenn., will manufacture men's and misses' hosiery as soon as the necessary machines can be secured and installed.

The Tomah Knitting Co. has started manufacturing operations at Tomah, Wis.

The Merit Hosiery Company, New York, has increased its capital stock from $200,000 to $1,000,000.

The P. H. Hanes Knitting Company, Winston-Salem, N. C., has amended its charter to increase its capital stock from $2,000,000 to $12,000,000. There are 6,000,000 each of the preferred and common stock, the common being $10 shares and the preferred being $100 shares. P. H. Hanes is president of the company.

The Not-A-Seam Hosiery Co., Philadelphia, Pa., has increased its capital stock from $308,000 to $1,035,500.

The Dixie Mercerizing Company has been organized at Chattanooga, Tenn., with a capital stock of $750,000.

The Thatcher Spinning Co., Chattanooga, Tenn., is building an addition which will increase the capacity of the plant from 21,760 to 30,464 spindles.

The Portage (Wis.) Underwear Manufacturing Company has taken steps to enlarge its production of underwear. In line with the present plans, an additional building has been purchased, which will be remodeled and will be equipped with additional machinery.

The Clemens Silk Co., Archbald, Pa., will erect an addition to its plant.

The United Hosiery Mill Corporation, Chattanooga, Tenn., is building about 100,000 additional square feet of floor space at its main plant.

The Harvest Silk Mills have been incorporated at Albany, N. Y., for the manufacture of silk textiles, with a capital stock of $100,000.

The National Knitting Company, Milwaukee, Wis., will erect a three-story factory addition, 75 x 145 feet, costing approximately $60,000.

The Washington Hosiery Mills Company has been incorporated at Nashville, Tenn., with a capital stock of $100,000, to manufacture men's and misses' hosiery. The incorporators are: O'Bryan Washington, Frank W. Washington, Charles C. Trabue and Avery Handley.

The Durham (N. C.) Hosiery Mills have revised their plans for their silk hosiery plant at Durham and will have a se -story steel and concrete building about 115 x 255 feet, fully equipped with a lunch room and modern industrial conveniences. The engineering work is being done by J. E. Sirrine, Greenville, S. C.

The Navy Knitting Mills, Inc., have increased their capital stock from $50,000 to $100,000.

The Sulloway Mills, Franklin, N. H., said to be the largest woolen hosiery manufacturing concern in the world, is engaged in some extensive welfare work. A fully equipped first-aid room has been installed and plans are being made for a restaurant.

The Randleman (N. C.) Hosiery Mills Company has increased its capital stock from $50,000 to $75,000.

The Delplie Mills, Inc., have increased their capital stock from $20,000 to $100,000.

The Tennessee Mills, Knoxville, Tenn., are building an addition for the manufacture of shirts and drawers.

The Export of Knit Goods.

Aside from the scarcity of fine counts of cotton yarns, mercerized and silk, and the fact that the knitting mills are operating on an average basis of 65 per cent of capacity, as accounting for the shortage of knit goods in general, a further explanation, as to hosiery specifically, is found in the official figures covering imports and exports.

Hosiery exports for the nine months to September 30, 1919, amounted to 6,544,025 dozens, against 3,814,850 dozens for the corresponding period of 1918. Here is shown an increase of 2,725,175 dozens leaving the country in excess of the exports of the previous year, for the nine months period, with the country on a shorter workday basis. During the same nine months of enormous growth in exports the imports amounted to only 61,559 dozens, a falling off of 49,992 dozens.

The value of imports as a whole continues negligible, amounting to $688,702 for the nine months to September 30 last. Exports of all classes of knit goods for the same period were valued at $25,677,868, of which $6,054,913 represents underwear and $18,636,761 hosiery. The total exports show increases of $14,240,499 over the nine months to September, 1918, and $15,732,464 for the corresponding period in 1917.

Since the settlement of the New York longshoremen's strike and consequent improvement in ocean shipping, foreign houses are even more interested in American knit goods than at any time earlier in the year, and call for prompt delivery as a first consideration, price taking second place.

Exports of domestic cotton and artificial silk hosiery during September amounted to 717,741 dozen pairs of cotton valued at $2,125.488, and 98,957 dozens of artificial silk, of a value of $599,559. This is a falling off of both classes as in contrast with August. The totals for the nine months to September 30 are 94,055,720 pairs. The larger shipments in September were to the following countries:

Belgium, 21,596 dozens cotton; Denmark, 114,748 cotton and 10,481 artificial silk; France, 32,455 cotton. Greece, 10,153 cotton; Italy, 4,587 cotton and 4,016 artificial silk; Netherlands, 25,931 cotton; Norway, 12,178 cotton; Rumania, 16,752 cotton; Sweden, 39,146 cotton; England, 125,574 cotton and 43,602 artificial silk, 8,500 dozens of the latter going to Scotland in addition; Canada, 27,568 cotton and 4,070 artificial silk; Mexico, 10,901 cotton; Jamaica, 9,370 cotton; Cuba, 56,657 cotton and 2,245 artificial silk; Argentine, 54,216 cotton and 4,929 artificial silk; Chile, 11,734 cotton; Australia, 28,926 cotton and 10,705 artificial silk; Russia in Asia, 5,843 cotton. Of the South American republics, Colombia, Ecuador, Peru, Uruguay and Venezuela took from 4,000 to 6,000 dozen pairs each.

No matter what you may be doing in the mill, there are two ways of looking at your job. One is to feel that you are in a treadmill, with the door locked. The other is to feel that you are a part of the concern, that you can grow with it, that your work is not a dull grind, but a path alive with opportunity. Which is your view?

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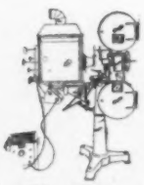

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Riverdale Cotton Mills	Riverview, Ala.
Chickasaw Ship Building Co.	Mobile, Ala.
E. E. Jordon Lumber Co.	Riderwood, Ala.
Good Pine Lumber Co.	Good Pine, La.
W. M. Cody Lumber Company	McNary, La.
Stonewall Cotton Mills	Stonewall, Miss.
Aluminum Company of America	Maryville, Tenn.
Virginia Iron, Coal & Coke Co.	Roanoke, Va.

and a score of other industrial plants.

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It lays right,—stays right and is right

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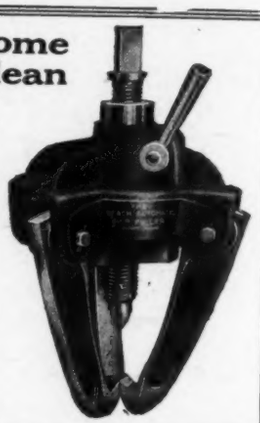
which is the best tool made for the purpose, and can be used for removing wheels, gears, commutators, transmissions, pulleys, etc.

Strong, simple and trouble-proof. Adjusts itself instantly and locks in any position. Capacity 1 to 18".

Sent on 10 days' trial, and if it doesn't prove indispensable, your money will be refunded. Write today for bulletin and prices.



THE GREB CO., 81 State St., Boston, Mass.

Drinking Fountain Sanitation.

Eminent authorities have conducted exhaustive and scientific tests on drinking fountain types on which complete reports have been made by each. They show some interesting facts.

Tests made in the laboratory of Medical Bacteriology at the University of Wisconsin in 1916 by Prof. Clark, with vertical stream fountains show bacteria remaining therein from 2 to 135 minutes, which he claims the slant stream overcomes. He further says, "Why retain a vertical column of water when it is obviously the upward direction of flow, which more than any other factor renders the bubbling fountain unsafe."

Dr. H. A. Whittaker, Director of Sanitation, of the Minnesota State Board of Health tested 77 vertical stream bubbling fountains at the University of Minnesota with similar results. Quoting from his report:—"Streptococci were actually present in the water discharged from the fountains and could be transmitted to the mouth of a consumer even though the lips were not touched to the infected parts. These facts suggest the possibility of the fountain being a factor in the transmission of certain communicable diseases."

Following these tests, fountains were marketed with slant streams varying from 20 to 50 degrees, most of which were furnished with a hood.

In an investigation made by the Rundle-Spence Co., they found objections raised to a stream of decided slant on account of its "hose-like" force causing difficulty in drinking. Also fouling of the decided slant stream was demonstrated by tests made by the late Major J. J. Kinyoun, U. S. Army Medical Corps, who said:

"When cultures of bacteria in egg albumen were dropped in the slant stream between the crest of the jet and the nozzle, the organism could be found in abundance on the nozzle a few seconds afterward. This was accounted for by the fact that the velocity of the water was greater in the center of the stream than at the periphery, thus causing an eddy in the stream to the nozzle."

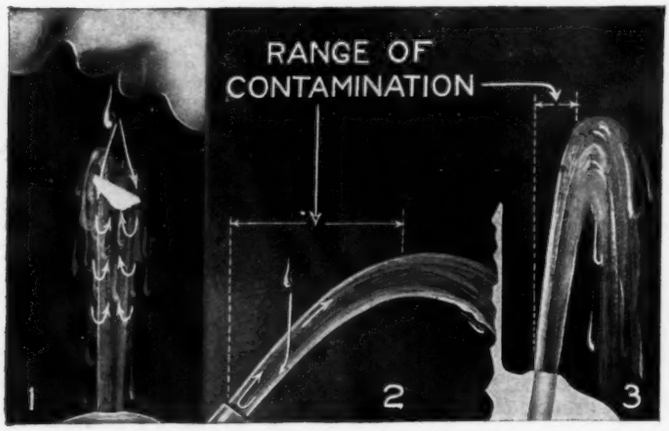


Plate 1 shows how the vertical stream returns the bacteria laden water to the top of stream.

Plate 2 shows the Rundle-Spence interpretation of the fouling point in the Kinyoun test.

Plate 3 shows the lessened area of contamination with the Rundle-Spence "Vertico-slant" stream.

The problem is to avoid exposing a large area of considerable length to the possibility of contaminated material sliding down the outer surface of the stream to the nozzle, as shown in plate No. 2. In the "Vertico-slant" the exposure of the surface of the rising jet to contamination is even less than in the vertical stream, Plate 1, because only one side is so exposed, the other side being protected by the arch of flowing water.

The stream of minimum slant, but one that insures all the water falling to one side is an improvement on both streams heretofore used for it cannot be contaminated as readily as the stream of greater slant and cannot draw the falling water back into the ascending column, as is the case with the vertical stream, which was demonstrated in the tests made at the University.

It obviates the necessity of a separate valve for drawing water to fill a glass or cup, a convenience in hospitals, offices, factories or picnic grounds, as the slight angle makes it possible to fill an individual drinking vessel as readily as from a faucet.

It overcomes the objection raised to the possibility of contamination from the hood wherein the corner of the mouth may readily touch it. The recess or well feature used on this type of fountain makes it possible to dispense with the hood, as the location of the nozzle is such that it cannot be touched with the lips.

A drinking fountain expert to whom this type of fountain was submitted stated that it overcame every objection heretofore raised. The only criticism he could possibly make was that the fountain could not be used in case water pressure was so low that the stream would not extend up to the top of bowl. This is a point of decided strength, not weakness. If the stream is too low, measures will naturally be taken at once to improve the supply. If it cannot be improved, a bubbling fountain should not be used. In many cases cutting down the volume of water to lower the monthly water bill has produced a condition in the use of bubbling fountains wherein they are more deadly than the common drinking cup, as the drinker not only puts his mouth on the drinking head, but sucks therefrom.

The ⅜-inch nozzle opening used with this fountain is far more economical from point of water consumption than the globe shaped or hollow body drinking heads, the latter requiring more water to elevate 1 inch than the ⅜-inch nozzle requires to project above the top of bowl. While using a minimum amount of water it also presents with its short bore a minimum surface, an important point when the matter of fouling is considered. Quoting from Prof. J. H. Dunlap's (University of Iowa) report on this point: "Furthermore, it has been shown by actual experiment that the inside of the bubbler becomes at times heavily polluted by bacteria from the mouth. This may easily happen in many intermittent types of fountain for when the water is turned off, the bulb which forms the jet drains out and consequently bacteria will follow the water, as it subsides."

The greater the surface the greater the amount of bacteria and usually the harder to clean.

The Wisconsin State Board of Health in a recent report covering tests of many bubblers having a shell body or other design that cannot be readily cleaned says: "Their use should and most likely will be by lawful regulation prohibited."

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We have perfected a cotton tape belt for driving Universal Winders. Also one for Cameless Winders. We urge all users of these machines to write us for samples. We offer these with our full indorsement because exhaustive tests have satisfied us of its real merit.

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SEVERAL NEW FEATURES have been added to the "1912" Cloth Cutting, Folding and Winding Machine which add at least 50 per cent to its value to YOU.

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It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from every bolt of cloth.

It cuts the corners of expense in every way and leads to more and greater profits.

THE ENORMOUS SAVING WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write us.

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Exporting to Brazil.

BY ERNEST L. LITTLE.

The war has created many economic advantages for Brazil. The demand on the part of the belligerents for foodstuffs and raw materials has stimulated agricultural production to an output far in excess of pre-war records.

This development of production is reflected not only in the increased volume of goods exported during the last four years, but also in the greater consumption of imported and home-made goods within the country. In order to meet this increased demand, the industrial plants have undergone a prodigious development since 1914. This is especially noticeable in the growth of the textile industry and accounts for fully forty per cent of the total production of manufactured products, most of which are cotton goods. It is less than twenty-five years since the first textile mill was started in Brazil, and since that time the industry has rapidly increased, owing to improved machinery and to increased transportation facilities which have brought the cotton fields, the mills and the consumer into closer contact.

Despite the increased production of cotton goods there remains a large market in Brazil for American textiles. If the American exporter to Brazil has suffered by comparison with rivals of other countries, it is due chiefly to the comparatively recent entry of the United States into the field of international trade. An imperfect acquaintance with Brazilian business houses, commercial conditions and customs, as well as with the more general conditions, tastes and preferences of the Brazilian people, are the main reasons for the misunderstandings which have arisen in the past.

The important factors in foreign trade are the price and quality of the goods, the tastes and preferences of the foreign market and the terms of payment. In the past, the American exporter has been disposed to place emphasis on the price and quality of his goods as his strong selling points, rather than to make concessions to the preferences of his customers or to meet the terms of payment most agreeable and usual in Brazil.

It should be noted that the last two factors often outweigh the others in the mind of the Brazilian importer when he is making a decision between competitors. The taste of the Brazilian buyer is a matter to be studied in detail and the exporter should work in closest cooperation with his representative or agent.

Regarding the other factor, terms of payment, there are certain items that should be carefully considered. The important variations in practice between American exporters and certain European rivals are largely those of credit terms, the disposition of documents and the adjustment of claims. The credit extended to Brazilian houses by American exporters is usually on a basis of 60 to 90 days sight draft or 120 days date draft, and these terms are generally satisfactory.

The primary consideration of Brazilian houses in asking for credit is the length of time necessary to inspect and clear the goods from the Custom House and this frequently requires from 30 to 60 days after the arrival of goods in Rio. Rarely do Brazilian houses ask for a longer time than is necessary for the clearing and arranging the goods in stock, but credit for this period is considered indispensable and generally it will be difficult to build up export trade on any other basis.

Another point which has caused considerable trouble is the disposition of documents, as European exporters have made a practice of sending them direct to the customer and not attaching them to the draft. The importer usually desires to see the goods before accepting the draft, and provision for this should be made by the exporter either by authorization or by sending documents direct to the purchaser. This procedure should not be followed when there is any doubt about the financial standing and responsibility of the foreign importer.

The American exporter should follow with exact compliance the instructions of the Brazilian importer regarding measurements, weights, quality, packing and invoices. Upon the exporter's faithful attention to these particulars, often depends the salability of goods in Brazil.

The method of merchandising American products in Brazil depends upon the export policy of the exporter. There are two general methods of developing export trade, indirect and direct.

The indirect method consists of making arrangements with export or commission houses in this country to act as selling agents in foreign countries. Frequently export houses receiving orders from their foreign clients, purchase these goods from the manufacturer who receives payment in this country.

The direct method is the policy generally followed when a serious attempt is made to develop export trade. A very large proportion of foreign trade is secured by this method, upon the establishment of foreign branches or agencies. When the volume of business is not sufficient to open a branch office, it has been found advisable to appoint a responsible foreign house that can be induced to undertake the representation of the American exporter in its city or district. Such a house is naturally familiar with the language and business customs of the country, has a more or less extensive clientele through which it can distribute the goods it handles, and frequently employs its own traveling salesmen.

It is desirable, however, to use considerable care in the selection of these agencies in Brazil. They should be responsible and in a position to handle the goods to the best advantage and should be located in the trade centers that will most effectively cover the district assigned to them. The territory assigned to each representative in Brazil should depend upon the organization and the size of the prospective agency. It frequently happens that a Brazilian importer of textiles located in Rio de Janeiro, maintains branch offices throughout the country. When it is not possible to secure as a representative a company of this size, it will be necessary in order to obtain the greatest distribution, to establish agencies in all of the principal commercial centers as Rio de Janeiro, Santos, Sao Paulo, Bahia and Pernambuco.

Experience has shown that it is far more desirable for the American exporter to work through a resident agency than to attempt to sell direct, especially if it is the first attempt to enter the Brazilian market. The personal element is a larger factor than in the United States and on the careful selection of the local agent often rests the success of merchandising in Brazil.

The Yarn Market.

(*Continued from page* 105.)

30s and 40s. It was reported that a sale was made on 50s/2 warps at $1.85 a pound.

A concerted upward movement was also noted in the prices paid for two-ply combed peeler skeins and warps. Not so very long ago, it was a matter of considerable excitement among cotton yarn dealers and buyers when 80s two-ply combed peelers first touched $1 a pound. It will be noted that 40s were recently quoted at $2.10 and $2.25. This is only one instance to show that no comparison can be made between the present condition and the condition at some previous time.

This month has been obviously a sellers', or rather a spinners' market. The selling end of the market fortunately overcame the question of delivery and had the situation in their hands throughout the month.

There is considerable discussion in cotton yarn circles concerning the effect the high prices now prevailing in yarns will have upon the retail price of the goods to be made from the yarns now being handled. It is seen that the test of retailing is still many months ahead. Most of the yarns now being ordered will not be sold by the retailer until next spring and summer; furthermore, it is argued, the scarcity of the goods most in demand now will by that time will have become so accentuated that the still higher prices which the retailer must ask will be paid as willingly as are the retail prices now in effect, which are the result of a similar accentuation.

Another view is that the price paid by a manufacturer for his yarn is not so important a part of the basis for retail prices as might be thought at first glance. Therefore, an advance of, say, 50 per cent in the cost to a manufacturer of his supply of yarns for a year, does not mean that the retail price of the finished goods will have to be advanced to the same extent for that reason.

Again, the variety and grade of the retailed goods has much to do with the degree to which the price of the yarn from which they are made will affect the retail price. For this reason, it is asserted that the manufacturer is not taking such a big chance in buying high priced yarns. In addition, many manufacturers have been rather steady buyers, in small quantities, right along. Therefore, they have the advantage of buying low, as well as at the top; and their average for the year, thus far, is said to be by no means so formidable as the present price list would seem to indicate.

At present, there seems to be an indication that the yarn list has about reached the peak in price, at least for some time, though hardly any of those experienced in the yarn field can be induced to express an opinion as to the price future.

Following are recent quotations in the Philadelphia market:

Southern Single Skeins.

4s to 8s	.65	10s	.66
12s	.67	14s	.68
16s	.69	20s	.75 @76
24s	.83	26s	.87
30s	$1.00@$1.05		

Southern Single Warps.

8s	.65	10s	.66 @67
12s	.67 @69	14s	.68 @70
16s	.70 @72	20s	.80 @82
26s	.87	30s	$1.00@$1.05
40s	$1.25@$1.33		

Carpet and Upholstery Yarns in Skeins.

8-4 slack	.64
9-4 slack	.64
8-3-4 hard twist waste	.62 @63
8-3-4 hard white warp twist	.65 @68

Southern Two-Ply Skeins.

8s	.67	10s	.68 @70
12s	.69 @71	14s	.71 @72
16s	.74 @75	20s	.80 @82
24s	.92 @94	26s	.96 @98
30s	$1.04@$1.06	40s	$1.25@$1.35

Southern Two-Ply Warps.

8s	.67	10s	.70 @71
12s	.71 @72	14s	.74 @75
16s	.78 @80	20s	.83 @85
24s	.92 @94	26s	.98
30s	$1.05@$1.10	40s	$1.35@$1.45

Two-Ply Combed Peeler Skeins and Warps.

20s	$1.30@$1.35	24s	$1.40@$1.50
30s	$1.60@$1.70	40s	$2.10@$2.25
50s	$2.50@$2.65	60s	$2.95@$3.00
70s	$3.25@$3.40	80s	$4.00@$4.50

Southern Frame Spun Carded Yarn on Cones.

8s		10s	.68 @69
12s	.68½ @69½	14s	.70 @71
16s	.72 @73	18s	.73 @74
20s	.74 @75	22s	.76 @77
24s	.77 @79	26s	.82 @85
30s	.86 @90	40s	$1.10@$1.15
30s tying in	.80 @83		

Northern Mule Spun Carded Yarn on Cones.

10s	.70 @72	12s	.72 @73
14s	.73 @74	16s	.75 @76
18s	.76 @77	20s	.77 @78
24s	.79 @80	26s	.82 @84
30s	.90 @95	40s	$1.25@$1.35

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	$1.02@$1.03	12s	$1.03@$1.04
14s	$1.04@$1.05	16s	$1.05@$1.06
18s	$1.06@$1.07	20s	$1.09@$1.10
22s	$1.10@$1.12	26s	$1.15@$1.18
30s	$1.35@$1.40	36s	$1.45@$1.50
40s	$1.60@$1.65		

The C. J. Tagliabue Manufacturing Company is now sending out free of charge to agents, superintendents and officials of cotton mills, a new handbook on warp sizing containing 56 pages of useful data, tables, etc., on this subject. This book contains original articles and illustrations based upon practical tests and investigations conducted by a textile expert, which will no doubt prove helpful and suggestive in solving slashing and weaving problems. It is attractively bound in a durable cover and is of a size which can be conveniently carried in a coat or hip pocket. It was intended to sell this book for $1.00 each but, for a reasonable time, a copy of this informative guide and reference book can be secured without cost upon application to the company issuing it, the offices of which are at 18-88 Thirty-third Street, Brooklyn, N. Y.

Hearty cooperation is a larger factor than strict competition in building up a successful business.

Liquid EBG Chlorine

The Only 100 % Efficient Bleaching Agent

WHY waste time and money preparing your own bleaching solutions from lime?

WHY run the risk of yellowing and tendering your goods?

WHY pay excessive freight charges?

The most simple process of bleaching,—the bleach that contains 100 per cent. available chlorine—the bleach that diminishes the harshness in your goods and increases the tensile strength is E. B. G. Liquid Chlorine.

READ WHAT THESE WIDE AWAKE MILL MEN SAY ABOUT IT!

"We have thoroughly tested out your Liquid Chlorine on a practical scale and find that it is very satisfactory. We anticipate that it will not only give us a considerable saving in the price of our bleaching, but it also gives us a better white than our old method with bleaching powder, and finally the leached goods give much better results in the dye bath."
April 15, 1919. CHENEY BROTHERS, South Manchester, Conn.

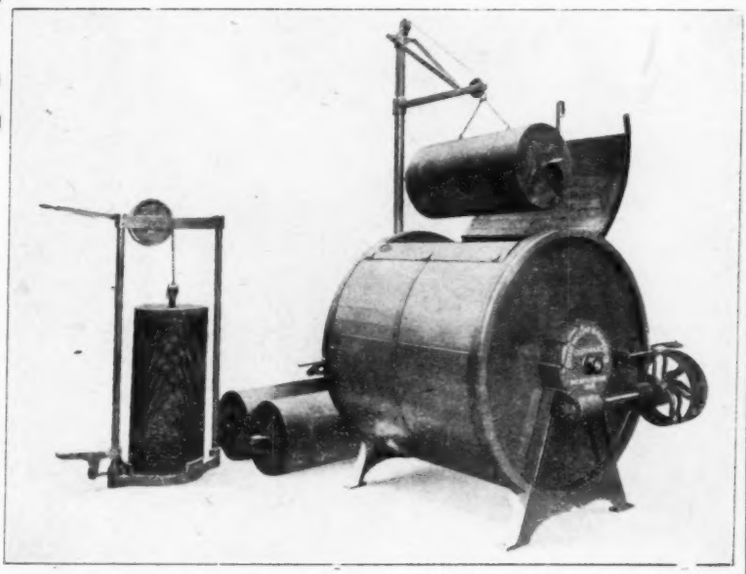
We would be pleased to send full particulars on request.

Electro Bleaching Gas Co. Main Office 18 E. 41st St. New York

Pioneers and Leading Manufacturers of Liquid Chlorine

PLANT: Niagara Falls, New York. **Chicago Office: 11 So. La Salle Street**

COCKER HOSIERY DYEING MACHINE



THIS machine has been thoroughly tested out with all colors and under all conditions, and is guaranteed to give the very best results possible in the dyeing of hosiery.

The stock is carried in four perforated metal containers equipped with one removable head on each container, and the containers mounted on Spiders in such a manner as to permit of their being loaded and unloaded quickly from the machine.

The Spiders carrying these containers are revolved in the vat *in one direction.*

Machines are furnished with either belt or motor drive.

Points of Advantage in This Machine That Must Be Considered

1st—Matting and chafing of the stock is entirely eliminated.

2nd—Percentage of re-dyes is reduced to a minimum.

3rd—Different sizes and descriptions can be handled in one dyeing without confusion.

4th—Time required for loading and unloading machine reduced to a minimum.

5th—Absolutely level dyeings on all colors.

6th—Minimum of power required for operation.

For further particulars and prices write or wire.

Cocker Machine & Foundry Co.

GASTONIA, N. C.

Builders of Textile Machinery.
Warpers—Beamers—Baling Attachments—Warp Dyeing Machinery—Reels

It is desirable, however, to use considerable care in the selection of these agencies in Brazil. They should be responsible and in a position to handle the goods to the best advantage and should be located in the trade centers that will most effectively cover the district assigned to them. The territory assigned to each representative in Brazil should depend upon the organization and the size of the prospective agency. It frequently happens that a Brazilian importer of textiles located in Rio de Janeiro, maintains branch offices throughout the country. When it is not possible to secure as a representative a company of this size, it will be necessary in order to obtain the greatest distribution, to establish agencies in all of the principal commercial centers as Rio de Janeiro, Santos, Sao Paulo, Bahia and Pernambuco.

Experience has shown that it is far more desirable for the American exporter to work through a resident agency than to attempt to sell direct, especially if it is the first attempt to enter the Brazilian market. The personal element is a larger factor than in the United States and on the careful selection of the local agent often rests the success of merchandising in Brazil.

The Yarn Market.

(*Continued from page* 105.)

30s and 40s. It was reported that a sale was made on 50s/2 warps at $1.85 a pound.

A concerted upward movement was also noted in the prices paid for two-ply combed peeler skeins and warps. Not so very long ago, it was a matter of considerable excitement among cotton yarn dealers and buyers when 80s two-ply combed peelers first touched $1 a pound. It will be noted that 40s were recently quoted at $2.10 and $2.25. This is only one instance to show that no comparison can be made between the present condition and the condition at some previous time.

This month has been obviously a sellers', or rather a spinners' market. The selling end of the market fortunately overcame the question of delivery and had the situation in their hands throughout the month.

There is considerable discussion in cotton yarn circles concerning the effect the high prices now prevailing in yarns will have upon the retail price of the goods to be made from the yarns now being handled. It is seen that the test of retailing is still many months ahead. Most of the yarns now being ordered will not be sold by the retailer until next spring and summer; furthermore, it is argued, the scarcity of the goods most in demand now will by that time will have become so accentuated that the still higher prices which the retailer must ask will be paid as willingly as are the retail prices now in effect, which are the result of a similar accentuation.

Another view is that the price paid by a manufacturer for his yarn is not so important a part of the basis for retail prices as might be thought at first glance. Therefore, an advance of, say, 50 per cent in the cost to a manufacturer of his supply of yarns for a year, does not mean that the retail price of the finished goods will have to be advanced to the same extent for that reason.

Again, the variety and grade of the retailed goods has much to do with the degree to which the price of the yarn from which they are made will affect the retail price. For this reason, it is asserted that the manufacturer is not taking such a big chance in buying high priced yarns. In addition, many manufacturers have been rather steady buyers, in small quantities, right along. Therefore, they have the advantage of buying low, as well as at the top; and their average for the year, thus far, is said to be by no means so formidable as the present price list would seem to indicate.

At present, there seems to be an indication that the yarn list has about reached the peak in price, at least for some time, though hardly any of those experienced in the yarn field can be induced to express an opinion as to the price future.

Following are recent quotations in the Philadelphia market:

Southern Single Skeins.

4s to 8s	.65	10s	.66
12s	.67	14s	.68
16s	.69	20s	.75 @76
24s	.83	26s	.87
30s	$1.00@$1.05		

Southern Single Warps.

8s	.65	10s	.66 @67
12s	.67 @69	14s	.68 @70
16s	.70 @72	20s	.80 @82
26s	.87	30s	$1.00@$1.05
40s	$1.25@$1.33		

Carpet and Upholstery Yarns in Skeins.

8-4 slack	.64
9-4 slack	.64
8-3-4 hard twist waste	.62 @63
8-3-4 hard white warp twist	.65 @68

Southern Two-Ply Skeins.

8s	.67	10s	.68 @70
12s	.69 @71	14s	.71 @72
16s	.74 @75	20s	.80 @82
24s	.92 @94	26s	.96 @98
30s	$1.04@$1.06	40s	$1.25@$1.35

Southern Two-Ply Warps.

8s	.67	10s	.70 @71
12s	.71 @72	14s	.74 @75
16s	.78 @80	20s	.83 @85
24s	.92 @94	26s	.98
30s	$1.05@$1.10	40s	$1.35@$1.45

Two-Ply Combed Peeler Skeins and Warps.

20s	$1.30@$1.35	24s	$1.40@$1.50
30s	$1.60@$1.70	40s	$2.10@$2.25
50s	$2.50@$2.65	60s	$2.95@$3.00
70s	$3.25@$3.40	80s	$4.00@$4.50

Southern Frame Spun Carded Yarn on Cones.

8s		10s	.68 @69
12s	.68½ @69½	14s	.70 @71
16s	.72 @73	18s	.73 @74
20s	.74 @75	22s	.76 @77
24s	.77 @79	26s	.82 @85
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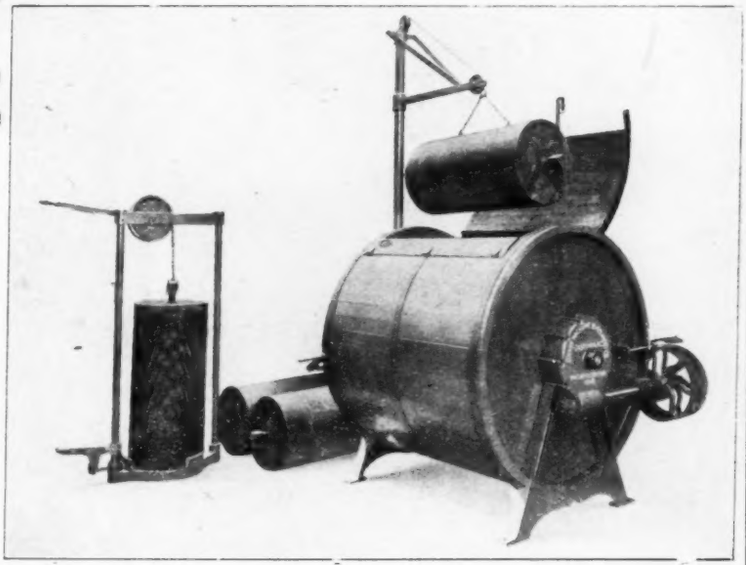

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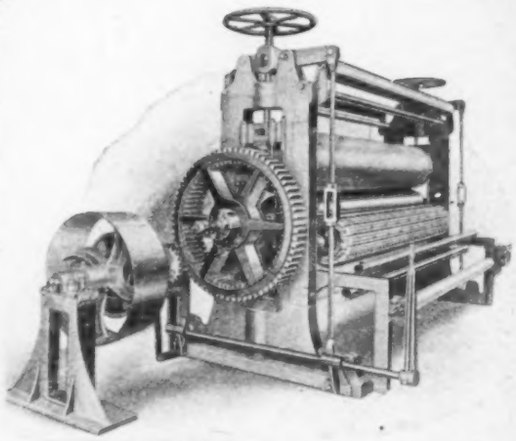


Calender (3-Roll) for Cotton Piece Goods.

WE are proud of having specialized on finishing machinery for nearly 100 years. But greater still is our pride in what every *Butterworth* machine does.

Write for catalog stating fabric and finishing required.

H. W. BUTTERWORTH & SONS CO.

Established 1820

PHILADELPHIA

Providence Office:
Turk's Head Bldg.

Canadian Representative
W. J. Westaway Company,
Hamilton, Ont. Can.

FINISHING
Butterworth
MACHINERY

Drying Research

¶ In these days of swiftly moving current affairs, the strictly practical man is engrossed in plant and production activities. He can give little thought as to what research facilities for investigating drying problems are available for his direct benefit.

¶ The advantages which ensue from an efficient drying method developed by research and experiment, cannot be overestimated.

¶ Many important developments and betterments in drying all kinds of raw and manufactured products have come from the Research Laboratory of The Philadelphia Textile Machinery Company.

¶ This Laboratory is prepared to investigate the drying of textile materials, and also to plan an equipment in which the drying can be performed economically, quickly and satisfactorily.

¶ The resources and equipment of the Laboratory are available to any manufacturer who desires to undertake such an investigation or to obtain the solution of his drying problems. There is no expense or obligation.

The Philadelphia Textile Machinery Co,

Drying Machine Specialists

Seventh Street and Tabor Road, Philadelphia, Pa.

CHICAGO, ILL. Hearst Building — CHARLOTTE, N. C. Realty Building — PROVIDENCE, R. I. Howard Building

HAMILTON, ONT., CAN., W. J. Westaway & Co., Main & McNab Sts.

93

B. & L.

Anti-Chlorine Bleaching Process

FOR COTTON

Simple
Scientific
Safe

BOSSON & LANE
Works and Office, Atlantic, Mass.

TOLHURST EXTRACTORS

Self-Balancing—Center-Slung—Suspended—Solid-Curb

have established new records for service, rapid operation and economy.

Remarkably adaptable to a variety of industries, they are especially serviceable and useful in the textile field because they eliminate the many difficulties usually encountered in other types of extractors and are unsurpassed for the separation and extraction of excess moisture.

The finished product of 66 years of exacting experience and test, the TOLHURST EXTRACTOR is **running all over the nation** because it has become recognized as the standard of its kind.

TOLHURST MACHINE WORKS

Established 1852. **Troy, N. Y.**

New York Office: 111 Broadway.

Southern Rep.,
Fred H. White,
Realty Bldg.,
Charlotte, N. C.

Western Rep.,
John S. Gage,
Hartford Bldg.
Chicago, Ill.

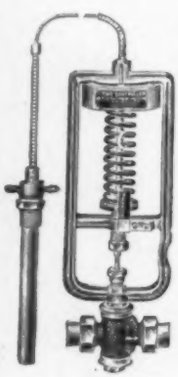
Canadian Rep.,
W. J. Westaway Co.,
Main & McNab Sts.,
Hamilton, Ont.
400 McGill Bldg.,
Montreal.

"A Better Product With Less Loom Breakage"

THE above illustration is a photographic reproduction of two pieces of cloth (woven at the same mill) before they were boiled out, scoured or bleached. The "size" mixture, yarn, etc., were identical except that each piece of cloth was sized at *different* temperatures

Note the difference in texture—how much softer and more uniform in appearance the texture is where the warp had been sized at a lower temperature and *uniformly* maintained at 185° F. by having the size boxes equipped with

"TAG" Self-Operating SIZE BOX Temperature Controllers



Moreover, the mill superintendent reports that "the warps are now woven easier with *less breakage* of yarn and the cloth is *superior* in feel and cover."

You, too, can secure this decided advantage by determining the *exact* temperature at which your "size" mixture will produce the best weaving results and then be sure to avoid *harmful temperature fluctuations* by equipping your size boxes with "TAG" Self Operating Size Box Temperature Controllers. No compressed air or other auxiliary motive power is required.

For further information write for Bulletin C-387 and include details of your specific requirements.

C. J. TAGLIABUE MFG. CO.
TEMPERATURE ENGINEERS
18-88 Thirty-Third St. Brooklyn, N.Y.

HYDROXY
TRADE MARK — REGISTERED

KIER OIL

A **Solvent** for the **Oils** and **Greases** on **Cotton** and the Mineral Oils which get on the cotton from the machines.

Used in the Boil before Bleaching or Dyeing.

Produces an even **Bleach** or **Dye.**

HYDROXY "DEVELOPENE"

for finishing Dyed Hosiery, Fabrics, Yarns, etc.

Develops the Black—makes a lustrous Black out of a poor one.

Sample sent on request.

Kali Mfg. Co.

Chemists.
Philadelphia

1404-1410 N. Front St. 1409-13 N. Hope St.

A corner of the Washroom of the American Mill Village Laundry installed by The Ware Shoals Mfg. Company.

How Ware Shoals Saves 15,600 Work Days a Year

The women workers who stayed at home a day each week to do the family washing used to cost The Ware Shoals Mfg. Company of Ware Shoals, S. C., a loss of 15,600 working days a year.

Then this company installed an American Mill Village Laundry.

Now, instead of doing their own washing, 211 out of 300 families in the Mill Village send their bundles to the Mill Village Laundry, where it is done for them at a nominal cost.

Today, production at Ware Shoals is practically undisturbed by washday layoffs.

You may be confronted with this same problem. It can be solved for you as it has been solved for other mills—with the American Mill Village Laundry.

Write for complete details today.

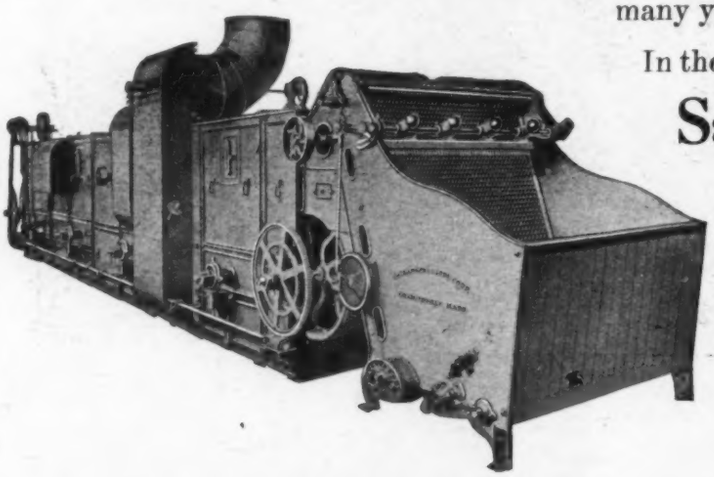
The American Laundry Machinery Co.

Specialty Department C. **Cincinnati, Ohio**

Also Makers of the American Automatic Underwear Press—Underwear Finishing Press—Knit Goods Calenders—Hydro Extractors—Rotary Fulling and Dyeing Machines—Rotary Hosiery Presses.

SARGENT DRYERS mark progress in Dryer Development comparable to that made in other fields of mechanical endeavor.

They are favored with a natural preference because they are designed on basic principles of air circulation, conveying, and general drying apparatus construction, which have had the approval of discriminating mill men and drying engineers for many years.



In the

Sargent Dryer

these principles have been combined and refined, making a complete machine which is unexcelled.

For drying cotton, linters, wool, hair, flax and other classes of raw material.

J. G. SARGENT SONS Corp., GRANITEVILLE MASS.

FRED H. WHITE, Southern Agent, Charlotte, N. C.

VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience

DU PONT AMERICAN INDUSTRIES

DU PONT DYESTUFFS

A SELF-CONTAINED American dyestuff industry means, first of all, *protection* to America and American industries.

Protection to the nation in time of war in that it furnishes the plants, the technique and the intermediate products for the manufacture of high explosives and poisonous gases.

Protection to our one source of supply for the synthetic medicinals that are the chief reliance of medical science in relieving pain and in fighting disease.

Protection to the textile, leather, paper, printing ink, paint and other dyestuff consuming industries producing over two and a half billion dollars of manufactured goods a year, employing over one million people and representing upwards of two and one-half billion dollars in invested capital.

Protection to industries indirectly dependent on an uninterrupted supply of dyestuffs for their maintenance producing over three billion dollars of manufactured goods a year, employing over a million people and representing nearly two billion dollars in invested capital.

In developing and safeguarding, with every means at our disposal, a self-contained American dyestuff industry, American manufacturers are therefore laying and preserving the very keystone of our national and industrial independence.

E. I. du Pont de Nemours & Co.
Dyestuffs Sales Dept.
Wilmington ∴ Delaware

Branch Offices
New York *Boston* *Providence*
Philadelphia *Chicago*
Charlotte, N. C.

DU PONT

"BRETON"
MINEROL "F"

FOR

Cotton Piece Goods

"We are pleased to say that adding the *Breton Minerol "F"* in our boil has given us a softer finish."

BORNE, SCRYMSER COMPANY

80 South Street, NEW YORK

BOSTON **PHILADELPHIA**

Works: Elizabethport, N. J.

Frank Hemingway, Inc.

115 Broadway

NEW YORK C TY

Dyestuffs Intermediates Chemicals

Victoria Blue B.
Crystal Violet Conc
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Congo Red
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Direct Fast Yellow
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Factory . . . . . Bound Brook, N. J.
Warehouse . . 27 Thames St., New York City
Branch . . . . . London, England

MONOPOLE OIL

Reg. Trade-Mark 70991.

Special Sizing and Finishing Products for Cotton, Wool and Silk.

Cream Softener
Soluble Oils
Bleaching Oil
Sulphur Black
Levuline
Glasgow Sizing

Hydrosulphites for All Purposes.

JACQUES WOLF & CO.

Manufacturing Chemists and Importers.

Main Office and Works, PASSAIC, NEW JERSEY

New York Office: 100 William Street.

218 West Kinzie St., Chicago, Ill.

The Grasselli Chemical Company

"Dyestuff Department"

Works at Grasselli, N. J.

Albany, N. Y. { *Formerly Owned by*
Providence, R. I. { *The Bayer Co., Inc.*

SULPHUR COLORS: Black, Blue, Brown, Green

Direct Cotton Colors, Acid and Chrome Colors

MONOPOL OIL

Bichromate of Soda *Sodium Sulphide*

Zinc Dust, Chemicals and Acids

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Chicago	Cleveland	Cincinnati	St. Louis
Detroit	New Orleans	Milwaukee	St. Paul, Providence

The GRASSELLI CHEMICAL CO., Limited

Toronto **Hamilton** **Montreal**

STOCKS CARRIED AT ALL PRINCIPAL POINTS

Jettison your Worries

Established 1870 *Incorporated 1890*

Get the Soap Question off your mind

Tell us

What kind you want—
How much—and
When.

We will deliver

The kind you want—
The quantity you want—
At the time you specify.

The Warren Soap Manufacturing Company

Warren Service Makes Good

77 Summer Street, Boston, Mass.

You Can Cut Your Labor Costs 1-3 and Save 12 Hours at Every Operation!

Manufacturers of Mock Egyptian and other light shades of cotton underwear, gloves and hosiery are doing this by adopting the

AUTO GYP PROCESS OF DYEING

Patented U. S. A., Sept. 16, 1916
Patented CANADA, Oct. 10, 1916
Patented GREAT BRITAIN, July, 1917

ELIMINATES ALL BLEACHING

Requires no special equipment or appliances.
Requires no special skill.
Produces a better **looking** fabric.
Produces a better **feeling** fabric.
Produces perfectly level and evenly dyed shades.
Produces perfect uniformity of shades.

Give Us a Chance to Prove This in Your Own Plant

—Under Your Own Conditions
—With Your Own Equipment

At Our Expense

Write us for full information and addresses of satisfied users —people you know.

SURPASS CHEMICAL CO., Inc.
ALBANY, N. Y.

The Reward of Merit

Substantially one-half of the Sulphur Black now used in America is being made by us.

Users of our Atlantic Blacks know the reasons behind our enormous production.

Users of Sulphur Blacks other than ours would also benefit by finding out these reasons.

Atlantic Dyestuff Company

WORKS: BURRAGE, MASS.

SALES OFFICES:

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BOSTON, 88 Ames Bldg.
NEW YORK, 230 West 13th St.
CHARLOTTE, 706 Com. Nat. Bank Bldg.
PROVIDENCE, 334 Westminster St.
CHICAGO, 227 W. Randolph St.

Starch

EFFICIENCY and ECONOMY are the watch-words today. Modern mill men who hold to this motto are discarding ordinary, imperfectly refined starches and selecting those special types best suited for their individual conditions.

Some desire increased weight, all need increased strength and better weaving qualities for the warp.

You know the result you seek. We know and can provide the proper type of Starch.

Eagle Finishing

C. P. SPECIAL FAMOUS N.

BLEACHING and FINISHING PLANTS have learned that "any old" STARCH or DEXTRINE will not do the work. To secure the proper "feel", the desired weight, the attractive finish, careful discrimination must be exercised in selecting

STARCHES AND DEXTRINES

Me manufacture all approved varieties.

500 MILL 400 MILL

BLUE RIVER CRYSTAL
DEXTRINES and GUMS

Corn Products Refining Co.

New York

Southern Office *Greenville, S. C.*

Starch

1872 1919

CHEMICALS, DYESTUFFS COLORS, GUMS, OILS

FOR THE TEXTILE INDUSTRY

HEADQUARTERS FOR

ACID, BASIC, DIRECT, CHROME and SULPHUR COLORS; "CIBA" and "CIBANONE" FAST VAT DYES

A. KLIPSTEIN & COMPANY

644-652 Greenwich Street NEW YORK CITY

Leatheroid

MILL RECEPTACLES

The Truly Permanent Fibre Cars

Leatheroid No. 3 All Fibre Car. Solidly Built. All wearing surface protected.

Leatheroid cars, as all Leatheroid receptacles, are made of "Leatheroid"—the most durable and toughest, smooth fibre known, and the other parts are chosen with care, and put together right.

Leatheroid Cars stand the heaviest loads and roughest usage day after day, year after year, and then show very little effects of wear.

Leatheroid Cars, Roving Cans, Boxes, Baskets, etc., are made in all sizes and shapes.

Sold by Leading Southern Mill Supply Houses.

Rogers Fibre Company

Leatheroid Sales Division

1024 Filbert Street, Philadelphia

Leatheroid No. 2 Steel-Clad Car. Nothing Equals it for Construction, Finish and Serviceability.

New Conditions Made Practical

The low-production period so prevalent just now proves that high wages and short hours are no panacea, unless coupled-up with improved methods of getting out the product.

The old way of operating without *standards* for the different jobs provided no goal for the operative to work for; no guide as to output required; no production-equivalent for time.

But by counting the product of each machine —letting the operative see what's *expected* of him from the records of

Veeder
COUNTERS

—you can bring up the standard of the day's work to a point where the new working conditions prove practical and profitable.

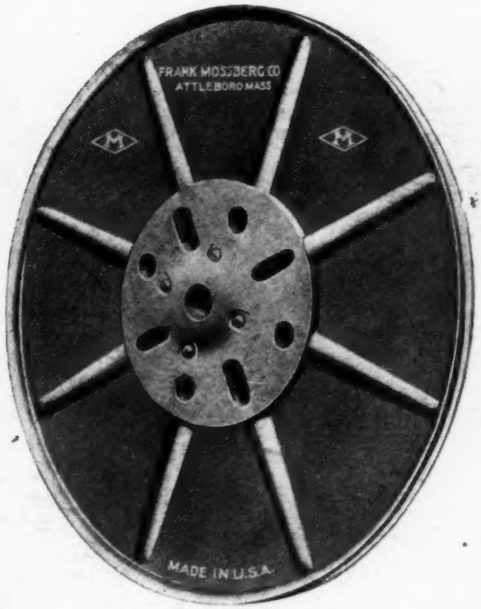
The Hank Counter illustrated above records the output of Spinning Frames, Mules, Cards, Lappers, Combers and any frame or machine where the product is ejected by rollers. Usually geared to measure in hanks of 840 yards each, and reads in plain figures. This counter is built especially and exclusively for textile machinery; its mechanism will stand service under **textile mill conditions;** it is not an adaptation of a counter for general machine use. Specially built models for other textile machines are shown in the Veeder booklet—**ask for copy.**

The Veeder Mfg. Co.
6 Sargent St., Hartford, Conn.

MOSSBERG

STEEL BEAMS AND SPOOLS

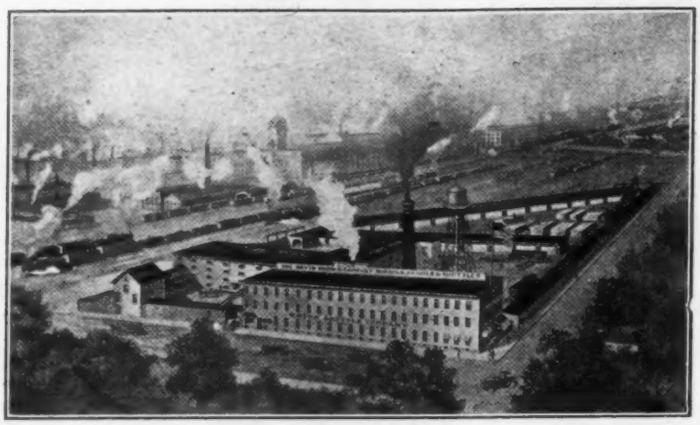
It's good business to buy Pressed Steel Beams, Reels and Spools, because the cost of repairs and replacements makes wood construction the most expensive. Steel is stronger and lighter than wood or cast iron.
No more split, cracked, splintered, warped or chipped beam heads or reels, when you use
MOSSBERG
PRESSED STEEL CONSTRUCTION
Because of the obvious superiority, mills all over the country are standardizing on Pressed Steel, saving money and the time wasted by frequent purchasing.
Send for catalog of Standard Pressed Steel Beams, Reels and Spools which take care of practically all winding and reeling requirements.



FRANK MOSSBERG CO.
ATTLEBORO, MASS., U.S.A.

The David Brown Company

Factories Lawrence, Mass. U. S. A.



High Grade Bobbins, Spools, Shuttles and Skewers.

Facilities are the Best.

Correspondence Solicited.

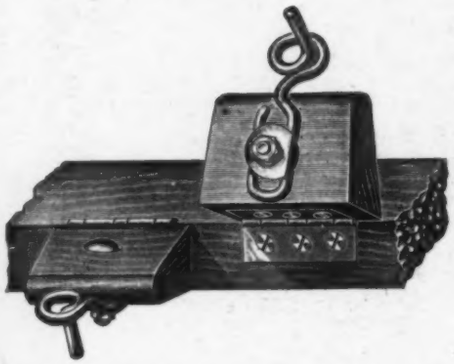
SPOOLS

Let us submit prices and samples on WARPER and TWISTER SPOOLS. Plain wooden head and metal shield. A list of Southern Mills using spools given on request.

Greenville Spool & Mfg. Company

Greenville, S. C.

The Palmer Adjustable Thread Guide



For Ring Spinning and Twisting Frames

Easily adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

Middletown, - - - Connecticut

AMERICAN SUPPLY COMPANY

PROVIDENCE, R. I.

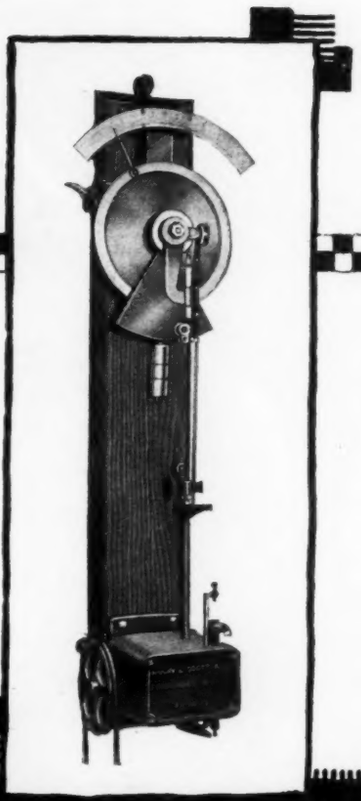
MANUFACTURERS OF

Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping,
Etc.

We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity. None too small to receive careful attention.

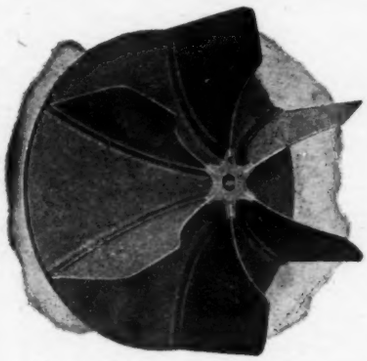
SCOTT TESTERS:



BREAKING strength of the single yarn or cord is of great importance in many industries. The cut shows a Scott Tester designed exclusively for this work. Extreme sensitiveness, rigid and simple construction, and easy and quick operation are noticeable in this model. The patented eccentric grip clamps with which it is equipped are the most practical and efficient yet designed for this work.

Catalog of this and many other Scott Testers mailed upon request.

HENRY L. SCOTT & CO. Providence, R.I.



Here's the Fan Wheel

That Has Made These Reversible Fans So Universally Successful in Cotton Mills

This fan wheel is the secret of the success of our reversible fans for conveying Cotton, Wool, Rags and Stringy Material of any kind.

This fan wheel is constructed with a cone-shape back of cast iron with sheet steel blades cast solid. Note the short overhang, which makes the fan run smoothly without vibration. This wheel offers less resistance to material passing through than any other wheel. It handles long, stringy material just as good as short material or lint.

And it's reversible.

The fan is built solid and runs without a tremor at maximum speed. No buckling of suction at high speed. No rivets to work loose. Universal adjustment of bearings, not simply up and down.

Made in any size, from 30 to 60 inch.

Folder R. F. explains fully. Ask for it today. Our catalogs No. 65 and 67 show complete line of fans and blowers for every class of work.

We have a large stock of repair parts which can be shipped at a moment's notice.

BUILT RIGHT RUN RIGHT

The New York Blower Co.

513 Transportation Bldg., CHICAGO, ILL.

Works: BUCYRUS, OHIO.

Leader-News Bldg. Cleveland, O. 502 Plymouth Bldg. Minneapolis, Minn. 303 B. F. Jones Bldg. Pittsburgh, Pa. 629 Nicholas Bldg. Toledo, Ohio. S. W. Life Bldg. Dallas, Tex.

E. C. Atkins Co., Memphis, Atlanta and Indianapolis, Ind.

370 Central Ave., East Orange, N. J.

HOLYOKE TRUCK COMPANY
EFFICIENCY QUALITY SERVICE
HOLYOKE MASS

For Simplicity and Positive Action Buy

Holyoke Trucks

THE G. M. PARKS COMPANY
PIPE ENGINEERS AND CONTRACTORS
THE TURBO HUMIDIFIER
FITCHBURG MASS

Dec. 21st 1917

Holyoke Truck Co.,
104 Race St.,
Holyoke, Mass.

Gentlemen:-

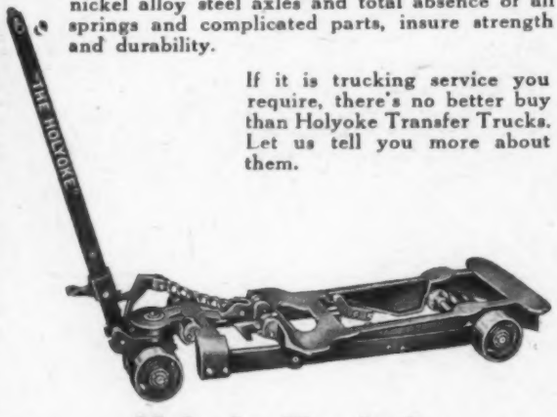
The truck which we have had in use for about a year appeals to us because of its simplicity and positive action.

Yours truly,
THE G.M.PARKS COMPANY.
HMP/B

Control of Holyoke Transfer Trucks is simple, instant and positive. The operator elevates, locks, moves, steers, lowers and releases by motion or pressure of the handle.

Careful designing, best materials and workmanship, Hyatt Roller Bearings, heat treated chrome nickel alloy steel axles and total absence of all springs and complicated parts, insure strength and durability.

If it is trucking service you require, there's no better buy than Holyoke Transfer Trucks. Let us tell you more about them.

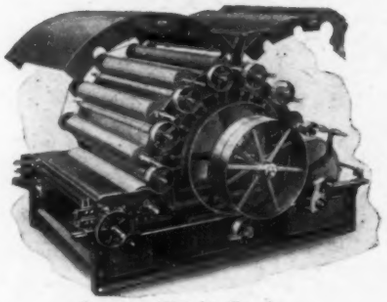


Holyoke Truck Co.

119 Race St., HOLYOKE, MASS.

Smith & Furbush Machine Company

Philadelphia



Cotton Waste Card.

Card shown above has been recently designed. It is especially adapted for the making of Absorbent Cotton, Wadding, Batts or Felts of the better grade, etc. Similar cards in sets are used for Cotton Waste Yarns spun on the woolen principle. Ask for circular S-165.

Specialists in all kinds of Waste Machinery.

FIRST

in appearance
in quality, and
servicibility

KEYSTONE "PEERLESS"

SEAMLESS ROVING CANS

Are right on the job many years after others have been "scrapped."

They are the lightest, and longest-lived roving cans on the market.

Your mill supply house has them.

Send for booklet showing the complete line of Keystone Holloware.

Keystone Fibre Company
Box 49 Yorklyn, Delaware

AN OPEN LETTER TO INDOOR TRUCK USERS

Gentlemen:

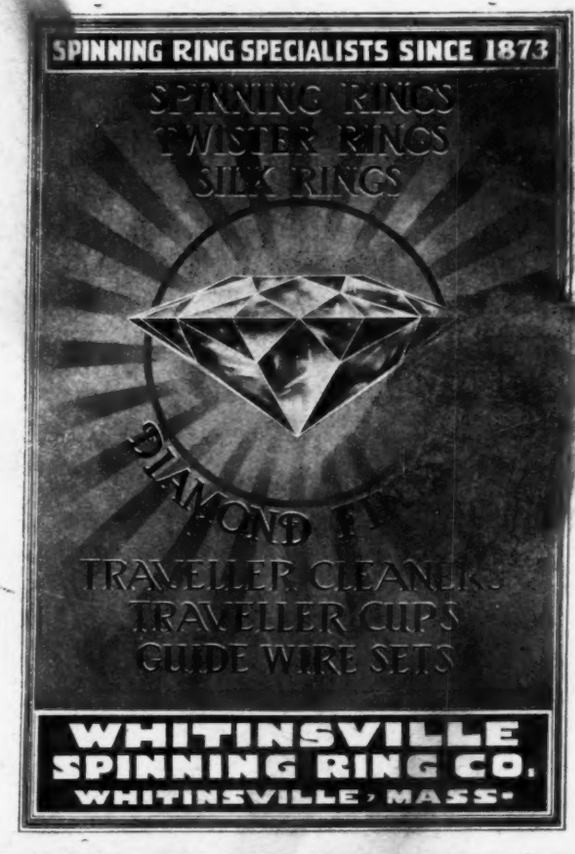
Indoor transportation--TRUCKS--has become a big problem. For years we have specialized in this line, maintaining truck experts, who go into your business analyze your truck needs. That we are equipped to ser you is best illustrated when we say that we can supp

Hand Trucks	Cotton Mill Trucks
Jacklift Elevating Trucks	Grocery Trucks
Barrel Trucks	Cotton Trucks
Platform Trucks	Electric Trucks
Lumber Trucks	Warehouse Trucks

and over 300 other styles

We have a special truck for every truck need--a truck for every line of business---trucks that speed up indoor transportation and save man power. Tell us your truck needs, and we'll make truck suggestions that will prove valuable to your business.

J. R. REGNAS & COMPANY
10 TIFT ST., ATLANTA, GA.



THIS
CONVINCING COMPARISON
SHOWS THE SUPERIORITY OF

SIGNODE SYSTEM

R THE USUAL BALE TIE.
S SEND YOU FULL DETAILS

SIGNODE SYSTEM, INC.
CHICAGO ATLANTA
Boston New York Philadelphia San Francisco

$\frac{5}{8}$" x .015 SIGNODE TIE	COSTS 12 % LESS PER FOOT	HOLDS UNDER 800 LBS. PULL	NO "SPIDER" TO INJURE HANDS
Compared with			
USUAL $\frac{5}{8}$" x .017 BALE TIE	COSTS 12 % MORE PER FOOT	BREAKS UNDER 500 LBS. PULL	DANGEROUS "SPIDER" OFTEN PRESENT

SEND YOUR BALES TO MARKET IN GOOD SHAPE

OUR Sewing Twines are made of Cotton, Hemp or Jute as best suited for the work to be done.

Utmost care is exercised in the choice of fibres. They are thoroughly cleaned by modern processes of manufacture so that all the dirt and imperfections are removed.

Henry C. Kelley Company
New York Atlanta

"Sonoco"

If we were to publish figures of the actual savings that are effected constantly by winding on

"Sonoco" Cones

you would think we were joking.

But

A trial run on your own mandrels will establish them for you:

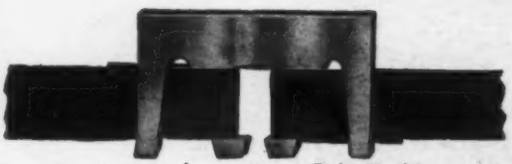
The Address Is

Southern Novelty Co.
Hartsville, S. C.

"Sonoco"

ACME

Cold Rolled Bale Ties used with Acme Bale Buckles or Acme Seals make Better Bales



Acme No. 9 Bale Buckle

Acme Nailless Strapping with Seal applied

ACME STEEL GOODS CO., MFRS., 10-14 Tift Street, Atlanta
Chicago Philadelphia Brooklyn St. Louis New Orleans

Tare Beam for automatic deduction of tare weight.

Dormant Platform Type

Automatic Weighing

SAVES TIME, LABOR, MONEY

The Kron Scale performs automatically the whole weighing operation, weighing the material as fast as it can be handled. It eliminates all false motions. There's no waiting for the pointer to come to rest—no fussing with weights. There's no chance for errors or guesswork. The correct weight is shown at a glance.

"Load and Look"

Kron Scales

AUTOMATIC Made in U. S. A. **SPRINGLESS**

All Metal Construction

Kron Scales have solved the weighing problem in hundreds of textile mills and leading industrial plants of every description and are daily proving their economy and efficiency.

There's a Kron for Every Weighing Purpose

ALL TYPES—ANY CAPACITY—*Dormant or Portable, Hanging Pan Types, Over-head Track Scales, Suspension Crane Scales, etc.*

Write for complete information

American Kron Scale Co.

422 East 23rd St., New York

Branch Office and Service Stations in Principal Cities

CANADIAN KRON SCALE CO., MONTREAL, CAN.

The Correct Solution to the Inside Transportation Problem

THE problem is—"How can we move the greatest amount of our various materials at the greatest speed and at the least cost?" To solve this, just peep in at the method used by the leading manufacturers of the country. They all point to one answer—the Storage Battery Truck—The **HUNT**.

WHY—Because of their speed, capacity and labor saved.

—because they speed production by rushing goods that are finished with one department, to the next.

—because they have strong, dependable, clean power to carry several tons on the level or up grades, to all departments of the factory.

—because of their ease of operation and flexibility in moving through narrow aisles and turning about in almost their own length

—because of the simple mechanism; few repairs and ease of recharging.

These are a few reasons why the largest mills use the HUNT Storage Battery Truck for inside transportation. What this truck is doing for other mills it can also do for you.

Send today for further information.

C. W. HUNT COMPANY Inc.,

140 Nassau St., NEW YORK

Sales Office
501 5th Ave. at 42nd St.

Works and Executive Office
West New Brighton, N. Y.

Branch Sales Offices:
Chicago Washington
Boston Philadelphia

HUNT

INDUSTRIAL STORAGE BATTERY TRUCKS

—No Guess Work Here

"THE STANDARD" SCALES

The Standard Scale and Supply Co.

PITTSBURGH, 1631 Liberty Ave.
NEW YORK, 145 Chambers St. CHICAGO, 163-171 N. May St.
PHILADELPHIA, 523 Arch St. CLEVELAND, 1547 Columbus Rd.
BALTIMORE, 409 N. Gay St.

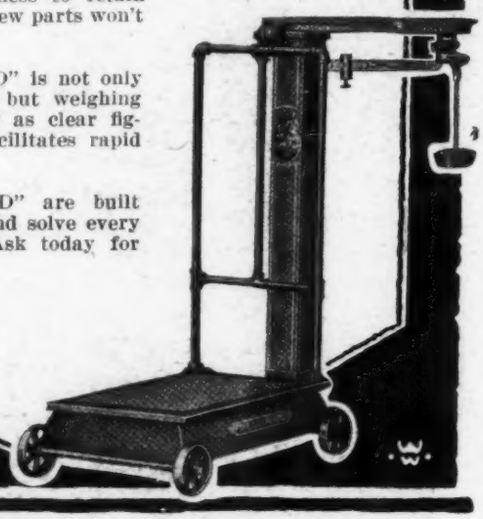
MOST scale manufacturers claim that their scales are accurate because ACCURACY is what is demanded of every scale.

And most scales *are* accurate—for a while, but how long do you think a scale will *remain* accurate if it hasn't the *strength*—the rugged durability to withstand the abuse and knocks that all scales are subjected to? It must be rugged or the accuracy will be knocked out of it. And then guess-work is necessary.

Don't take any chances. When you purchase "THE STANDARD" Scale—any model—you are assured first that it is extremely accurate and next that it REMAINS accurate throughout its life, because it's built with the strength and ruggedness to retain its accuracy, and its few parts won't get out of order.

"THE STANDARD" is not only accurate and strong, but weighing is done more quickly as clear figures and spacings facilitates rapid readings.

"THE STANDARD" are built to meet every need and solve every weighing problem. Ask today for catalog.



We Carry a Complete Line of

TEXTILE AND GENERAL MILL SUPPLIES

with large stocks in our warehouse, enabling us to give the mills **prompt shipment** on all orders.

Our organization is composed of men, having many years of experience supplying the needs of the Southern textile mills. We are in a position to not only fill your orders promptly, but to have our representatives investigate the conditions in your mill, co-operate with you in solving your problems and recommending the equipment and supplies best suited to your particular requirements.

We invite the opportunity of demonstrating our service to you.

The Mill Supply Company

Greenville, S. C.

Efficient Conveying and Storage Equipment Will Cut Down Your Labor Cost's.

Several years of specializing on conveying and storage equipment for cotton mills enable us to solve your problems in an intelligent way, to suggest the most efficient equipment for the work you have to do.

Without obligation on your part, one of our representatives will be glad to call and tell you frankly what our equipment can do for you.

REPRESENTATIVES FOR

Economy Engineering Co., Tiering Machines.
Automatic Transportation Co., Storage Battery Trucks.
National Scale Co., Platform Trucks.
Standard Conveyor Co., Gravity and Spiral Conveyors.
Berger Mfg. Co., Steel Lockers and Bins.

"Serving Southern Concerns"

J. D. COLLINS,

9th Floor, Grant Building, ATLANTA, GA.

PRODUCE MORE

Can be done easily by permitting us to install complete Cafeteria Equipment in your factory. We furnish everything complete for Kitchen and Dining Room. Southern Representative for John Van Kitchen Equipment. Furnish us with copy of Blue Print of your building and we will give you Blue Print of Practical Layout for your Kitchen and Dining Room without obligation on your part whatever. Write for our 300-page Catalogue.

THE WRIGHT COMPANY

(INCORPORATED)

Importers and Jobbers

HOTEL, RESTAURANT AND INSTITUTION EQUIPMENT

185 PEACHTREE STREET ATLANTA, GA.

WRIGHT GOODS WRIGHT PRICE WRIGHT SERVICE

Nickel-Plated Drop Wires

—in any size or style at only—

25c per thousand

above the price for regular finish. Our drop-wires are made of the best grade steel wire.

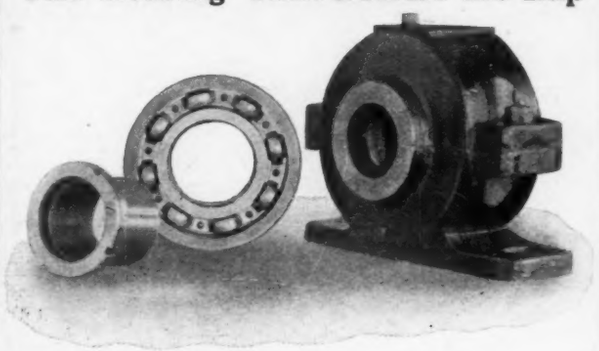
STEEL HEDDLE MANUFACTURING CO.

GREENVILLE PHILADELPHIA PROVIDENCE

Southern Office
111 Washington St., Greenville, S. C.
Hampton Smith, Sou. Mgr.

N. B. We are the sole manufacturers of Nickel-Plated drop wires for every kind of loom.

The Bearing That Betters the Lap



Ball bearings on picker beaters save power, oil, time, labor, and material, and practically eliminate maintenance expense.

They permit absolutely exact and permanent adjustment of beaters, which means evener lap with a better selvedge.

They keep all the oil in the box and off of the lap. They eliminate the shutdowns caused by hot boxes. They will pay for themselves in less than two years.

You either have them or need them. For information write to

Aldrich Machine Ball Works Bearings

Greenwood, South Carolina.

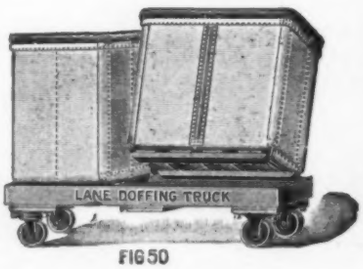


FIG 50

LANE

Canvas Mill Boxes and Trucks

FIG 20.

Lane Dofling Trucks are made to wear. Heavy Duck and Spring-steel frame permit rough handling. Light weight, easy running. Mounted on our improved Thread-guard Casters, either stationary or swivel.

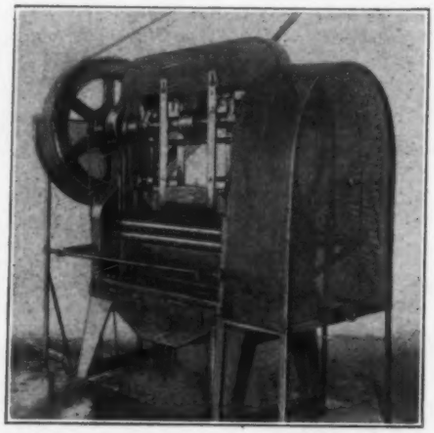
Born and Raised in the "Southland"

Lane Canvas Mill Boxes are free from all roughness, thus reducing waste. Rim bound with tough leather. Shoes of hard maple, renewable.

Sold direct and by leading Supply Houses.

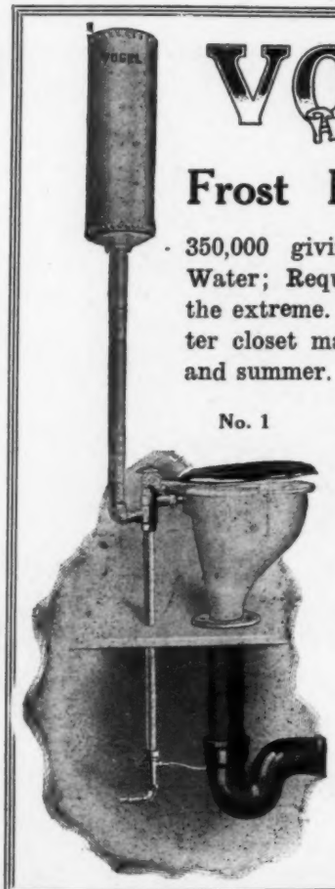
W. T. LANE & BROTHER, Manufacturers, Poughkeepsie, N. Y.

Beckley Perforating Co.
14 North Ave.
Garwood, N. J.



STEEL surfacing for sand rolls, Drying machines and ovens, Copper and brass centrifugal liners, Sheet steel for machinery guards, Steel vats, Kettles and Tanks, electrically welded.

SOUTHERN AGENTS
WILSON COMPANY, GREENVILLE, S. C.



VOGEL PATENTED

Frost Proof Closets

350,000 giving satisfaction. Save Water; Require no Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.

No. 1

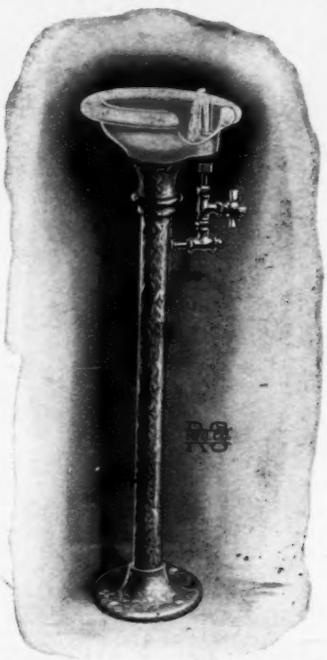
- Enameled roll flushing rim bowls.
- Heavy brass valves.
- Strong hardwood seat. Galvanized tank.
- Malleable seat castings will not break.
- Tested under hydraulic pressure before leaving factory.

SOLD BY JOBBERS EVERYWHERE

JOSEPH A. VOGEL CO.
WILMINGTON
DELAWARE

"Vertico-Slant" Stream Fountain

It possesses the copious drinking feature of the vertical stream as the mouth comes in contact with the stream at a point where it loses its momentum, and at the same time prevents the "bacteria dance" that takes place in the vertical stream fountain as determined by tests made by Prof. Clark in the laboratory of Medical Bacteriology, University of Wisconsin, also by several other eminent authorities.



Uses less water than the old style drinking head; reduces opportunity for squirting.

GLASS OR CUP CAN BE FILLED AS READILY AS FROM A FAUCET.

Easily cleaned as there are no sharp corners or crevices.

The nozzle so located that it is impossible for drinker to reach it with his lips.

Write for illustrated circular.

Rundle-Spence Mfg. Co.

MILWAUKEE, WIS.

Photograph of

Our Celebrated Coaster Slide

in Action

WE are the originators and patentees of the Wave Slide, patent No. 1239848. All persons are warned against purchasing other slides violating our patent. Write for our illustrated catalogue.

American Playground Device Company

AWARDED GOLD MEDAL PANAMA CALIFORNIA EXPOSITION 1915.

ANDERSON, IND.

Manufacturers of

PARK AND PLAYGROUND EQUIPMENT

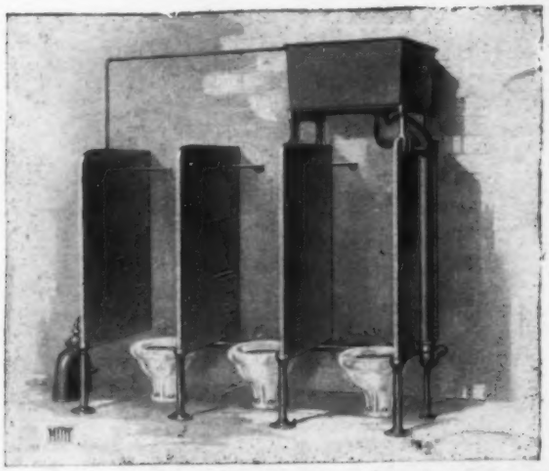
PORCH AND LAWN FURNITURE

AGRICULTURAL, BABY CARRIAGE AND

GO-CART WHEELS, STEEL AND RUBBER TIRE

1828 MOTT 1919

THE "PRIVUS" LATRINE FOR COTTON MILLS



The privacy of the separate closet with the strength, simplicity, and strong flush of the water closet range or trough, are combined in the "Privus" Latrine.

The bowls are built of extra heavy vitreous ware and will withstand the hardest usage while the rim seat which is formed in the ware eliminates all wood work.

"Privus" Latrines are giving satisfactory service in many cotton mills throughout the South.

MOTT SOUTHERN COMPANY

SHOWROOM AND WAREHOUSE — PETERS STREET VIADUCT.

ATLANTA, GEORGIA

THAT'S WHY MY MEN ARE LOYAL

I'VE made those colony houses fit to live in. You can't expect men and women to live in the midst of conditions that you wouldn't tolerate for yourself or your family. The Kaustine installation has meant money in my pocket. My workers are healthy and contented, and render far better service than before I installed Kaustine."

"For a time I was facing a serious problem. Men came and went away to better surroundings. My big labor turnover was costing high, and production was falling below standard."

"But the houses had no sewer connections and I didn't know what I was going to do.

Kaustine Chemical Toilet Systems

so'ved the problem and were my best investment. They require no water or sewer connection. Based on principles advocated by health authorities. Dispose of sewage immediately after discharge from body. Kaustine, a powerful chemical resolvent and germicide, insures sanitation. After disinfection in Armco Iron Tank, which renders the sewage odorless and harmless, the waste is flushed into leaching pool. The entire system is ventilated thoroughly by strong air currents. The tank and all metal parts are of Armco (the pure) Iron and especially treated.

Give your employes city conveniences.

Easily Installed at Low Cost

Write us. We can tell you how best to solve the problem in your district. The Kaustine catalog will be a revelation to you.

Our Engineers Are At Your Service.

Hydro-Kaustine

(Enameled Iron)

Septic Tanks

Where a water supply is available, and plumbing can be considered, the Hydro-Kaustine System of Septic Tanks affords a most practical means of disposal of household refuse. This is the latest Kaustine product, an unparalleled achievement.

Hydro-Kaustine Tanks are of Armco (the pure) Iron—not masonry. An enamel casting affords real protection from rust.

The septic process takes advantage of the fact that sewage contains the means of its 'wn destruction.

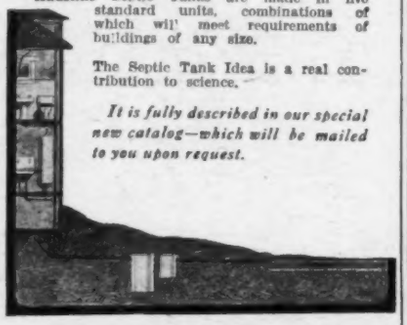
The elements of the septic system are:

1. Septic Tank—with two compartments for transformation of the sewage.
2. Absorption Bed—where effluent from tank is absorbed by the earth and permanently disposed of.

Kaustine Septic Tanks are made in five standard units, combinations of which wil' meet requirements of buildings of any size.

The Septic Tank Idea is a real contribution to science.

It is fully described in our special new catalog—which will be mailed to you upon request.



KAUSTINE COMPANY, Inc., Manufacturers and Sanitation Engineers

Buffalo, N. Y. **Charlotte, N. C.**

You "Master Electricians" Know That Stanley Stands Up on Motor Drives

The high speed motor drivcs play havoc with the ordinary belt.—but Stanley Belting has such unusual flexibiliy and strength that it is used successfully by many mills for such service.

It is a solid woven cotton belting of a special weave that gives it the great flexibility needed to take hold of small pulleys—while its high friction cuts down starting slippage.

There are no "layers" to come apart under the strain of high speed drives—because there are no stitches to wear through or glue to dry out.

Being tightly woven, its stretch is extremely slight—the first adjustment the second or third day being generally sufficient.

The special compound with which it is impregnated renders Stanley Belting immune to oil, water, acid or steam.

We will be glad to "prescribe" a trial order belt for your belt troubles.

STANLEY BELTING

CORPORATION
36 Clinton St., Chicago

DIXIELITE

A white coating designed expressly for the walls and ceilings of factories and mills. Made in Flat, Semi-Gloss and Gloss Finish, will—

SAVE DAYLIGHT,
SAVE EYESIGHT AND
INCREASE DIVIDENDS, DUE TO BETTER WORKING CONDITIONS

Manufactured **Only by**

The Bay State

WADSWORTH, HOWLAND & CO., Inc.

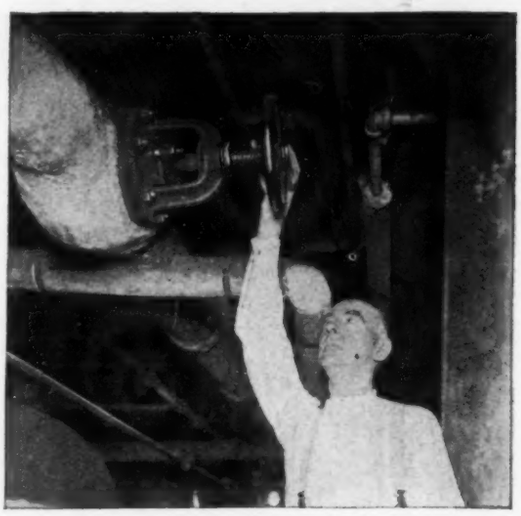
Boston, Mass.

Ware-Smith Paint Co., Agents for Georgia, 3rd floor Forsyth Bldg., Atlanta, Ga.

W. A. Williams, Southern Rep., P. O. Box 322, Greenville, S. C.

28 Discs in 28 Years—(Sometimes needed—usually not)

but aside from that, "Chief" Nugent of the Chase & Sanborn Co., Chicago, said that this 5" Jenkins Iron Body Globe Valve has never needed attention. (Chief Nugent makes a practice of replacing his discs once a year, whether needed or not.)
The valve, which has been in service for 28 years, is on the header line working under 115 lb. pressure. It is opened and shut every time the boiler is cleaned.



Jenkins Valves are made for all pressures. Knowing valve requirements and meeting them with a valve strong and heavy enough to stand the severest strain possible makes Jenkins Valves DEPENDABLE and of long usefulness.

An unfailing combination is Jenkins discs in Jenkins Valves. Your supply man can serve you—but to make sure of the genuine—*look for and demand* the Jenkins "Diamond Mark."

REG. U.S. PAT. OFF. TRADE JENKINS MARK Jenkins Bros

JENKINS BROS.

New York Philadelphia Boston
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Jenkins Valves

2082-J

AGASCO PAINTS

Number Nineteen preserves exposed metal surfaces against ravages of the seasons; contains no water, ammonia, or tar acids.

Number Fifteen, penetrative and germicidal, does the same for wood surfaces.

Number Three, Damp Proof, protects foundation walls; seals them against seepage.

Roof Coating Number One for felt, rubber or composition roofing; increases resistance against elements.

AGASCO Creosotes, wood-preservative: Number Seven, dark brown stain; Number Ten, crude; Number Eleven, clear, color to be added by you.

AGASCO ROOFING FELT
AGASCO ROOFING PITCH

ATLANTA GAS LIGHT Co

ROOM 235, 20 FAIRLIE STREET

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also proceed merit as surely in machinery as in men.

Time, skill and effort must also proceed merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

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ENGINEERS—FOUNDERS—MACHINISTS
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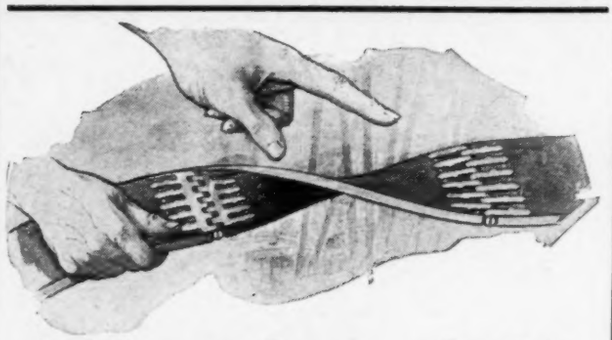
Branch Office 141 Milk St., Boston, Mass. 20 73X



A Belt is as Strong as Its Joint

A chain is no stronger than its weakest link. Nor is a belt any stronger than its joint and the strength of the joint depends on the quality and kind of lacing used.

Alligator Steel Belt Lacing

is a separable hinge lacing for use on all fabric, leather, and rubber belts. It grips the belt on both sides, making a strong, durable and smooth joint that runs easily over small pulleys and idlers.

Any workman with a hammer can apply it in a very few minutes.

Ask your dealer or write today for prices and descriptive literature.

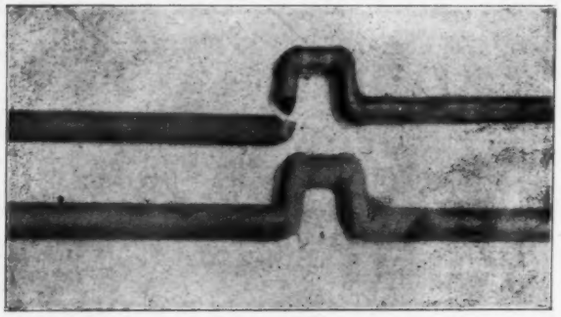
Sole Manufacturers

Flexible Steel Lacing Co.,

Dept. AL29

135 Finsbury Pavement, London, E. C., England.

522 So. Clinton St., Chicago, Illinois.



It Is the Little Things That Coun

In one of the prominent cotton mills of the South, the saving effected by B-W Welding Apparatus as shown by the cost sheet covering a period of one year were as follows:

Department	Value of Parts if Purchased New	Total Cost of Welding, including Supplies, Labor, etc.	Actual Saving Over New Parts
Weaving Room	$1,835.43	$864.33	$971.10
Card and Waste Room	305.35		
Spinning and Spooling Room	99.80		
Slashing Dept.	53.75		
Cloth Room	45.15	576.22	495.58
Machine Shop	502.50		
Miscellaneous	62.25		
TOTAL	$2,907.23	$1,440.55	$1,466.68

Why not prepare NOW for those inevitable breaks that are bound to occur in your mill? Why not effect such savings as this in your mill by installing a

B-W Welding and Cutting Apparatus

We not only supply the machine, oxygen and supplies, but we send experts to your plant to teach your mechanic how to use it.

B-W SERVICE

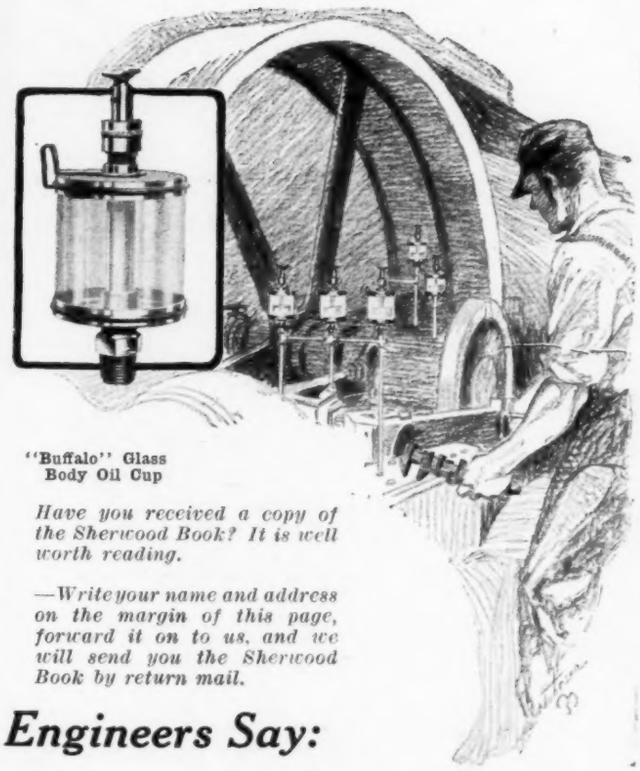
means that if you have a breakdown too large for your own mechanic, our experts are always ready to come to you.

Write today for catalog and price list.

BIRD-WILCOX COMPANY, Inc.

Oxygen, Oxy-Acetylene Welding and Cutting Apparatus and Supplies.

Atlanta, Ga. Savannah, Ga. Gretna, La. Chattanooga, Tenn.



"Buffalo" Glass Body Oil Cup

Have you received a copy of the Sherwood Book? It is well worth reading.

—Write your name and address on the margin of this page, forward it on to us, and we will send you the Sherwood Book by return mail.

Engineers Say:

Standardizing on Sherwood Specialties Spells Success

Shrewd engineers who have seen that success in building ships, automobiles, motor trucks and myriads of other things comes from standardization—know the advantages of standardization in their engine rooms.

These engineers standardize on the "Sherwood" Steam Specialties. They know that any line with twenty-five years of successful manufacturing experience back of it must possess merit.

Hence, these engineers are ardent users and boosters of the Hart Force Feed Oil Pump, "Buffalo" Glass Body Cylinder Oil Pump, Eagle Injector and the "Buffalo" Automatic Injector—all members of the meritorious "Sherwood" family.

As alert engineers, these men have found out, just as you will, that standardization means a big saving of time and money, and makes for success in any engine room.

Surely, if "Sherwood" Steam Specialties have been used successfuly by these engineers for over twenty-five years, you have enough courage to try them out and let standardizing on them make your engine room a success.

Sherwood Manufacturing Co.

Brass Founders and Finishers

Buffalo, New York, U. S. A.

SHERWOOD
ENGINEERING-SPECIALTIES

LUNKENHEIMER PRODUCTS

To the user they need no introduction—their high quality, reliability and serviceability having made a lasting impression.

Others seeking the "better grade" of Engineering Specialties will find in those bearing the name

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that high quality of design, materials and workmanship which is synonimous of **the best.**

"LUNKENHEIMER PRODUCTS" embrace a variety of high grade specialties for use on Steam Engines, Boilers, Locomotives, Steamships, Automobiles, Motor Boats, Airplanes, Tractors, etc.

Each device is designed for a particular purpose, and will perform the functions for which it is intended, with a **certainty** that insures safe, economical and reliable service.

Leading dealers everywhere sell **Lunkenheimer Products.** Specify and insist on having the genuine.

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"QUALITY"

Largest Manufacturers of High Grade Engineering Specialties in the World

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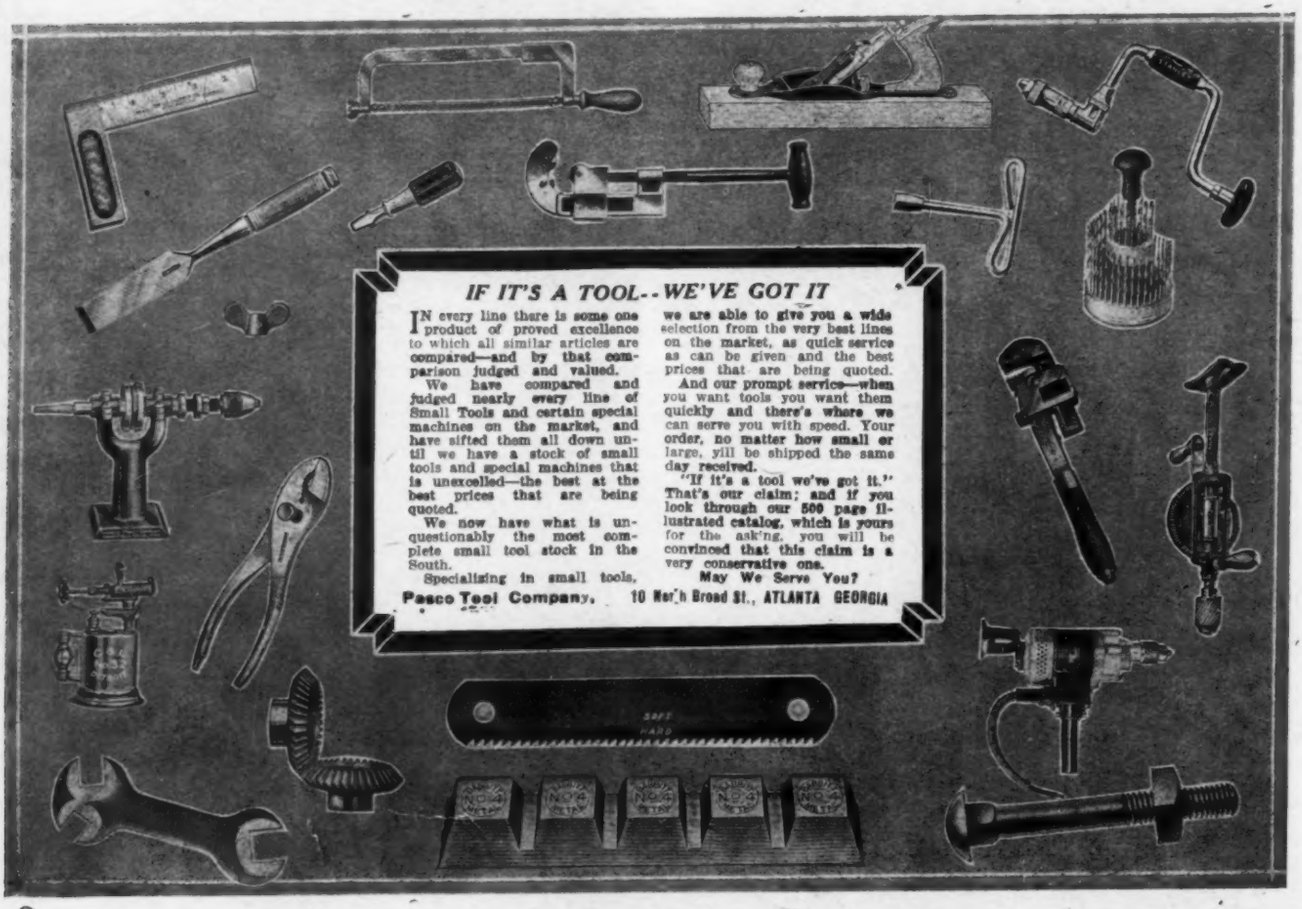
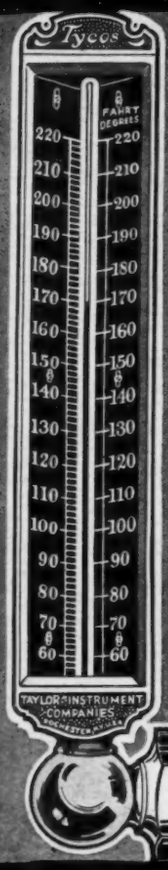

IF IT'S A TOOL--WE'VE GOT IT
IN every line there is some one product of proved excellence to which all similar articles are compared—and by that comparison judged and valued.
We have compared and judged nearly every line of Small Tools and certain special machines on the market, and have sifted them all down until we have a stock of small tools and special machines that is unexcelled—the best at the best prices that are being quoted.
We now have what is unquestionably the most complete small tool stock in the South.
Specializing in small tools, we are able to give you a wide selection from the very best lines on the market, as quick service as can be given and the best prices that are being quoted.
And our prompt service—when you want tools you want them quickly and there's where we can serve you with speed. Your order, no matter how small or large, will be shipped the same day received.
"If it's a tool we've got it." That's our claim; and if you look through our 500 page illustrated catalog, which is yours for the asking, you will be convinced that this claim is a very conservative one.
May We Serve You?
Pasco Tool Company, 10 North Broad St., ATLANTA GEORGIA



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If an industrial plant is properly equipped with *TYCOS* temperature instruments, heat control is no longer a difficult problem in production.

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Let us tell you about our efficient temperature aids. That we may answer intelligently name especial problem.

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THERE'S A *Tycos* OR *Taylor* THERMOMETER FOR EVERY PURPOSE.

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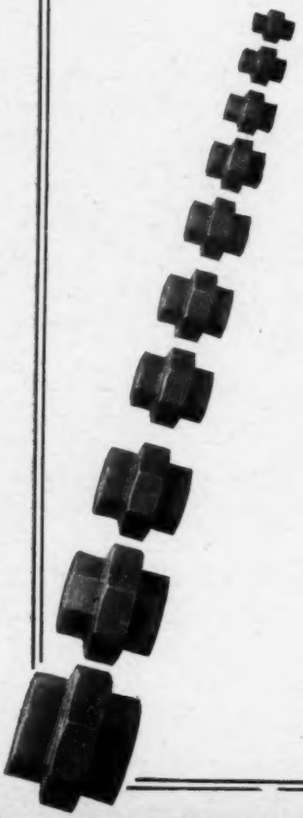

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EXTRA HEAVY —— MALLEABLE IRON

Navy Octagon Unions

are made with brass to iron seats, eliminating the use of gaskets; they have heavy rings, strong shoulders, and liberal bearings.

These unions are strong enough to meet the most exacting conditions of service.

CRANE CO.

836 South Michigan Avenue
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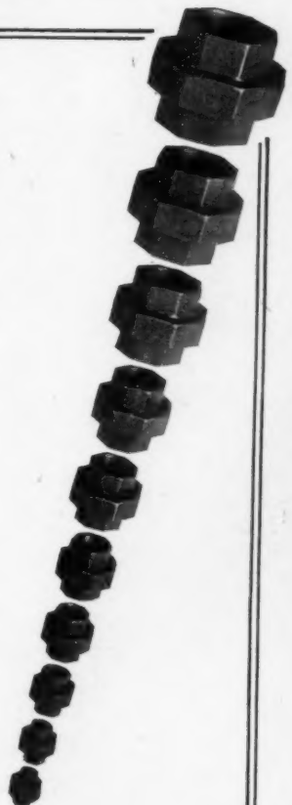
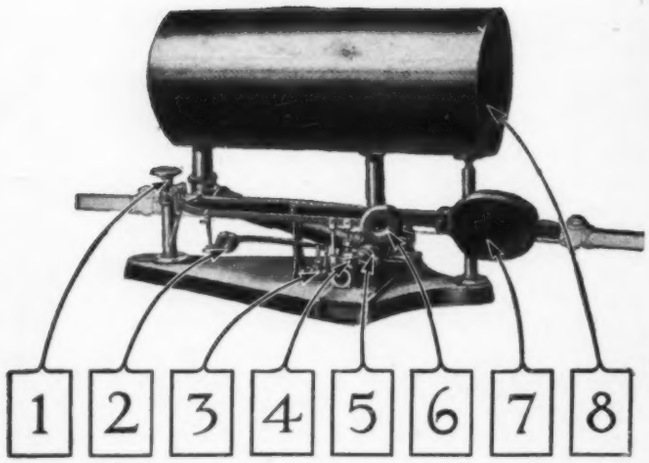
Sales Offices and Warehouses in 56 leading cities.





Eight Features That Assure Dependable Continuous Service

1. *Spring-cushioned buffer to receive impact of receiving chamber, thus insuring noiseless operation.*
2. *Weight and lever controlling the air-relief valve. The relief valve automatically closes before opening of steam valve and vice versa.*
3. *Automatic air valve for relieving the receiving chamber of all air pressure during period of filling.*
4. *Removable Disc Steam Valve regulating the steam supply to the Return Trap.*
5. *Nickel-plated brass trunnion and stud stuffing boxes. The trunnion provides for two passage ways to the receiving chamber, affording free circulation for condensation and the washing out of any accumulated scale or dirt. The stud gland boxes can be easily and readily adjusted as desired, permitting the trap to work freely and at the same time retain a secure steam tight bearing.*
6. *Weight and lever actuating and controlling the travel of the steam valve. This lever is so adjusted that it is impossible for the steam valve to pound itself to pieces.*
7. *Main lever and weight. The adjusting of the weight on the main lever is such that while allowing for the normal discharge of the contents of the tank, it prevents the discharge of that amount necessary for an effective water seal.*
8. *Copper-brazed pressure-proof tank.*

Whether there's a fuel shortage or not, you should make sure that your steam production cost is reduced to the lowest possible point.

The Morehead Back-to-Boiler System not only effects a fuel saving averaging 20 per cent, but keeps all steam heated equipment at maximum temperature by removing all condensation from steam lines, etc.

We'll gladly refer you to steam plants—similar to your own—where the Morehead System has paid for itself during the first few weeks.

Write for the Morehead catalog. It fully explains why the Morehead System pays big dividends by reducing fuel consumption.

Morehead Manufacturing Co.

Cotton Mill Department.

DETROIT, MICHIGAN.

Canadian Morehead Manufacturing Company, Woodstock, Ont.

Positively Drains All Types of Steam Apparatus — Delivers Condensation And Feed Water to Boiler Under All Conditions at Maximum Temperature — The Morehead Return Trap — Your Fuel Bills Are Less

Morehead

"BACK-TO-BOILER-SYSTEM"

MACHINE TOOLS

Lathes, Drill Presses
Shapers, Planers
Electric Motors
Automatic Gear Cutters
Etc.

Everything for the Up-to-Date Machine Shop.

"Economy is buying wisely, not cheaply"

SEEGER MACHINE TOOL CO.
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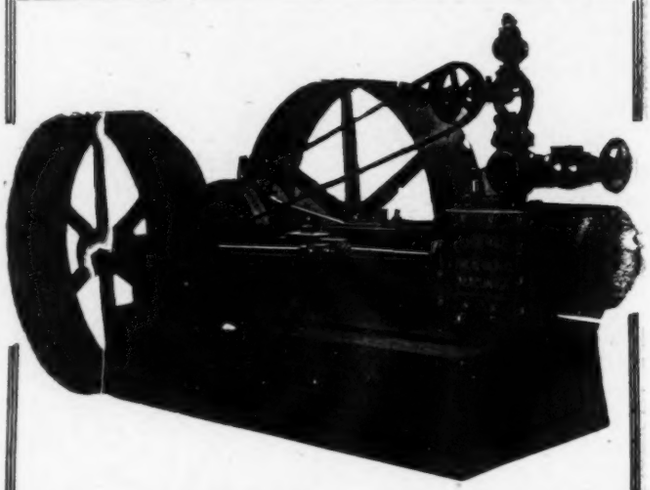

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MANUFACTURERS OF

High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.

Heavy Castings and Wrought Iron Works.

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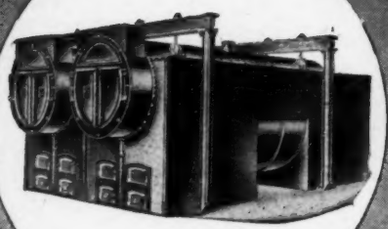

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MORE STEAM WITH LESS FUEL.

Economical fuel consumption, dry steam and more of it, low maintenance cost, perfect circulation, minimum cost of installation—combine to make the Walsh & Weidner Tubular and Water Tube Boilers the most practical and economical boilers for the modern power plant.

Let us tell you about the many superior features of these boilers and how easy and inexpensively they can be installed. Write today.

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Your Biggest Dividend Payer

Old Colony STEAM HOSE

No investment in plant equipment brings in the returns that money invested in
OLD COLONY STEAM HOSE
does.

Its superiority is shown in the
Heavy Rubber Cover
Special Braided Jacket of the highest tensile strength
Duck woven especially for this hose
Tubes especially compounded for hardest service

You are taking no changes in ordering it as it is fully guaranteed.

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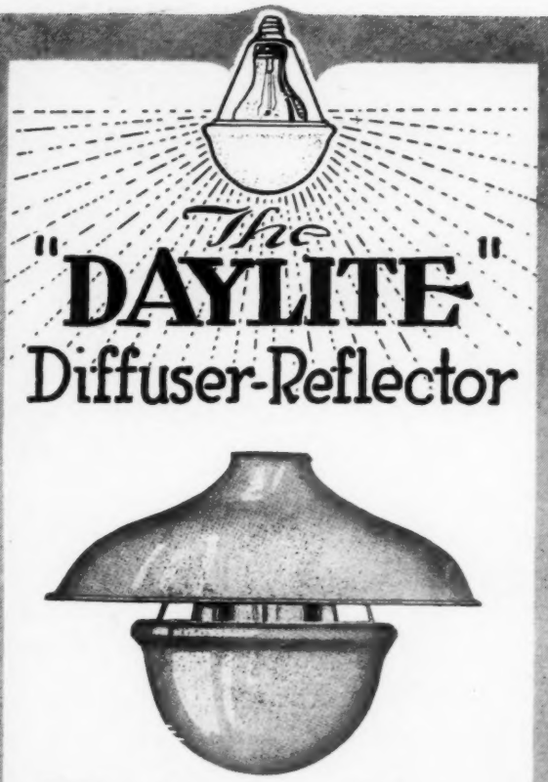

The "DAYLITE" Diffuser-Reflector

Eliminates Glare

Take the glare out of your lighting system.

Out in the mill there are men who are never free from glaring light. You pay for their headaches, layoffs, the material they waste and seconds they produce, and finally their damaged eyesight.

Take the glare out of your lighting system—don't consider that it is sufficient to have merely plenty of light, but see that there is plenty of the *right kind* of light.

The "DAYLITE" Diffuser-Reflector diffuses the light over a large area, producing an effect that resembles daylight. There is no glare, no deep shadows, but an even distribution of bright, yet congenial, glareless light.

Made for use with any form of Tungsten or type "C" lamps up to and including 200 watt; can be attached to any fixture.

Write today for catalog.

Luminous Specialty Co.
Indianapolis, Indiana

Machine Tools, General Mill and Machinery Supplies
SEEGER-WALRAVEN COMPANY
38 West Alabama Street Atlanta Georgia
Service and Satisfaction
THE House of Seeger-Walraven Co., better known as "The House You Know," is truly Southern Headquarters for machine tools, mill and machinery supplies—right at your back door, ready with a big stock to furnish you with the hundreds of tools and supplies that you might call for.
Mill Superintendents and Practical Master Mechanics come to us because they know that in addition to securing the most reliable and quality equipment guaranteed by the manufacturer, and ourselves—at the right prices,—they get the special co-operation in the selection of the right equipment for their needs, special plans, literature and suggestions.
Located as we are, we are able to render you the most prompt service, and you can depend on us to live up to our claims.
"The House You Know" has your interests at heart and wants to serve you the way you want to be served.
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MACHINE TOOLS.
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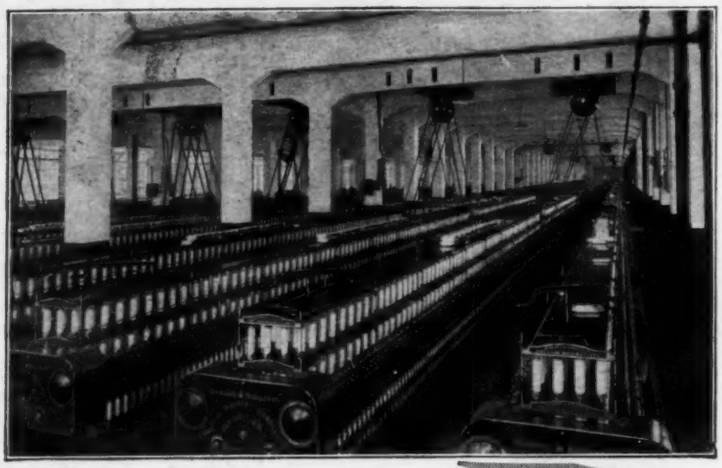
Better Results From Your Equipment

YOU may have been doing your work week after week in the same way, believing that you were getting the best possible results. But this is a mighty swift age and new methods of doing things are being invented day after day—methods which help you get better results from your machinery, your employes, your entire equipment.

These are methods you should know about—they are always advertised and in such a way that it's a rare advertising page that will not yield one good suggestion to you.

Suppose you read the advertising pages of this issue thoroughly and see how many methods suggest themselves to you by which you could make a much better showing, by which you could save time and expense—then act.

Motor Drive for Spinning Frames



Allis-Chalmers Spinning Frame Motors include special motors for industrial drive as well as group drive and for old and new mills.

Our special four-frame motor, with all pulleys on one end, allows any spacing between frames and makes it unnecessary to move the frames in electrifying old mills.

Send for our new Textile Bulletin.

ALLIS-CHALMERS

Milwaukee. Wis. U.S.A.

ECONOMY Renewable Fuses

are the *right* fuses to protect *your* electrical circuits

—because they afford the right sort of protection; their reputation lends assurance that you can safely depend on them for accuracy of rating and all-around efficiency in operation.

—because they cut annual fuse maintenance costs 80% as compared with the use of one-time fuses, owing to the fact that an inexpensive "Drop Out" Renewal Link restores a blown Economy Fuse to its original efficiency.

—because it's the work of a moment to replace the link and renew the fuse.

—because a good sized stock of "Drop Out" Renewal Links always on hand represents but a small outlay.

Write for Catalog 12

ECONOMY FUSE & MFG. CO.

Kinzie & Orleans Sts., **CHICAGO, U. S. A.**

Sole Manufacturers of "ARKLESS"—the Non-Renewable Fuse with the 100 per cent Guaranteed Indicator.

ECONOMY FUSES ARE ALSO MADE IN CANADA AT MONTREAL

When Electrical Supplies are Urgently needed it is

QUICK SERVICE

That Counts

In this day of speedy production every hour means sixty "golden" minutes and every machine that fails in the performance of duty is a waste of time and energy.

When you are in need of Rubber Conduit Wire, Safety Switches, Wiring Devices, Fuses, Lamps and other electrical supplies, it is only a matter of a very few hours until we can place them in your hands.

With a large warehouse, filled with all the needfuls, and facilities for handling rush orders in the shortest possible time, we can be of real genuine service.

Wire or Phone your orders and watch for results

Carter Electric Co.

63 Peachtree, Atlanta

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CERTIFIED PUBLIC ACCOUNTANTS

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Advertising conserves the Manufacturer's time by acquainting him with a service or product at his leisure long before the need for such arises.

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DIXIE COTTON WASTE COMPANY

GREENVILLE, S. C.

Cash Buyers Cotton Mill Wastes—Linters Always in the Market.

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Selling Direct to Consumer.
NEW ACCOUNTS SOLICITED.

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QUALITY YARNS
Gray Manufacturing Co.
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ARROW MILLS
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WHEN buying yarns—look for the trademark—the pride mark, of these famous spinning mills. They are your assurance of quality in every instance.

It is our aim to render the most efficient service to the trade by supplying yarns made from the best long staple cotton.
—to inspect carefully all packing and shipments.
—to give prompt attention to all inquiries.
—to see that the goods go forward at the time promised.

Combed Peelers, 30s to 80s, single and ply. Regular and reverse twist.
Combed Sea Island, gassed and ungassed, 30s to 80s, single and ply, reverse twist.
Carded Peelers, 40s, 50s and 60s.
Double Carded Peelers, 30s to 60s.

Our production is sold directly through, and exclusively by, our general sales offices at 131 East 23rd Street, New York City.

H. A. FLORSHEIM, Sales Mgr., Long Distance, 812 Gramercy.

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COTTON YARNS
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PARKDALE YARNS ARE THE BEST
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TRADE FLINT MARK
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INCORPORATED
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Capital $2,000,000 *Surplus $500,000*

Inaugurated by the GUARANTY TRUST COMPANY OF NEW YORK
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We are merchants in credit. The vast resources of the National Bank of Commerce in New York are employed to provide a volume of credit adequate to the needs of manufacturers and merchants who have outgrown local banking facilities. Extending credit for the purchase of supplies and the movement of goods demands an understanding of world production and world markets.

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FROM THE

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U. S. Department of Labor

ROGER W. BABSON,
Director General,
Information and Education Service
W. B. WILSON, Secretary

22-38E

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Thomas Co., F. H.

Acetylene Welding Apparatus.
(See Welding Apparatus.)

Acteylene Gas.
Bird-Wilcox Co.
Commercial Acetylene Supply Co.

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(See Auditors and Accountants.)

Air Brakes.
Allis-Chalmers Mfg. Co.

Air Washers
American Blower Co.
Carrier Eng. Corp.
New York Blower Co.
Parks-Cramer Co.
Sturtevant Co., B. F.

Air Conditioning Systems.
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Albone.
Roessler & Hasslacher Chemical Co.

Alkalies.
(See Dyestuffs and Chemicals.)

Aniline Colors.
(See Dyestuffs and Chemicals.)

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(See Dyestuffs and Chemicals.)

Aprons-Rub.
Ladew & Co., Inc., Edw. R.
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Graton & Knight Mfg. Co.

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Aberthaw Construction Co.
Belmont Iron Works.
Draper, E. S.
Huntington & Guerry, Inc.
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Lockwood, Greene & Co.
Sirrine, J. E.
Slattery & Henry Co.

Ash Handling Machinery.
Hunt Co., C. W.
Link-Belt Company.

Asphalt Slate Shingles.
(See Slate Asphalt Roofing.)

Auditors and Accountants.
American Audit Co.
Atlantic Audit So., Inc.
Lemon & Co., G. L.

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(See Trucks—Auto.)

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Automatic Scales.
American Kron Scale Co.

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Hyatt Roller Bearing Co.
New Departure Mfg. Co
U. S. Ball Bearing Co.

Ball Bearing Spindles.
(See Spindles—Ball Bearing.)

Ball Bearing Housings.
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Saco-Lowell Shops.
Seeger Machine Tool Co
Southwark Fdry. & Machine Co.

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Economy Baler Co.
Lovingood Co.
Philadelphia Drying Mchry. Co.
Seeger Machine Tool Co.
Smith & Furbush Mfg. Co.
Southwark Fdry. & Machine Co.

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Banding Straps and Buckles.
Acme Steel Goods Co.
Lovingood Co.
Regnas & Co., J. R.
Signode System, Inc.

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National Shawmut Bank of Boston.
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Mossberg Co., Frank

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U. S. Ball Bearing Co.

Belting.
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Williams & Co., I. B.

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Morse Chain Co.

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(See Rope Transmission.)

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Link-Belt Company.
Morse Chain Co.
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Belt Lacing.
Flexible Steel Lacing Co.

Belt Lacing.
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Belt Tighteners.
Link-Belt Company.
Williams & Sons, I. B.

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American Playground Device Co.
Hill-Standard Co.

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Butterworth & Sons Co., H. W.
Philadelphia Drying Mchry. Co.
Textile Finishing Machinery Co., The

Bleaching Machinery.
(See Dyeing, Bleaching & Finishing Machinery.)

Bleaching Materials.
Arabol Mfg. Co.
Atlantic Dyestuff Co.
Barrett Co.
Bosson & Lane.
Born, Scrymser Co.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Electric Smelting & Alum. Co.
Grasselli Chemical Co.
Hemingway, Inc., Frank
Kali Mfg. Co.
Kilpstein & Co., A.
National Aniline & Chemical Co.
Newport Chemical Works, Inc.
Roessler & Hasslacher Chemical Co.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques
Zavon, Inc.

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American Blower Co.
Carrier Eng. Corp.
General Electric Co.
New York Blower Co.
Phila. Drying Machinery Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Boards—Form.
Paramount Hosiery Form Drying Co.
Pearson, Jos. T.

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Draper Corporation.
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.
Shambow Shuttle Co.
Whitin Machine Works.

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Carpenter Co., Geo. B.
Crymes Mchry. & Supply Co.
Jones Mchry. Corp.
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Toomey, Frank.
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Permutit Co.
Refinite Co.
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Jenkins Bros.
Jones Mchry. Corp.
Lunkenheimer Co.
Stewart Elec. Co., Jno. A.

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Jos. Dixon Crucible Co.

Box Strapping and Tie Buckles.
Acme Steel Goods Co.
Draper Corporation.
Lovingood Co.
Regnas & Co., J. R.
Signode System, Inc.

Boxes—Mill.
Keystone Fibre Co.
Lane & Bro.
Leatheroid Sales Co.
Rogers Fibre Co.
Standard Fibre Co.

Braids.
(See Tapes.)

Brokers (Cotton).
Beer, H. & B.
Dixie Cotton Waste Co.
International Cotton Products Co.
Rose Co., Edward.

Brushes—Mill.
Felton Brush Co., D. D.
Felton, S. A. & Son Co.

Brushes—Commutator.
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Buckets & Pails—Mill.
Keystone Fibre Co.
Leatheroid Sales Co.
Rogers Fibre Co.
Standard Fibre Co.

Buckets—Elevator and Grab.
Link-Belt Company.

Buckles—Cotton Tie.
(See Box Strapping and Ties).

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(See Architects & Engineers.)

Buildings—Portable.
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Aladdin Co.
Lockwood, Greene & Co.
Tuxbury Lumber Co., A. C.

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Belmont Iron Works.
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Dufur & Co.
Lockwood, Greene & Co.
Nashville Hardwood Flooring Co.
Peaslee-Gaulbert Co., Inc.
Tuxbury Lumber Co., A. C.

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Aladdin Co.
Tuxbury Lumber Co., A. C.

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Southern Spindle & Flyer Co.

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Calender Rolls.
Roy & Son, B. S.

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Collins, J. D.

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Keystone Fibre Co.
Leatheroid Sales Co.
Rogers Fibre Co.
Standard Fibre Co.

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Philadelphia Drying Mchry. Co.
Phila. Textile Mchy. Co.
Sargents Sons & Co., C. G.
Textile Finishing Machinery Co., The

Carding Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

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Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

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Schofield, Wm. Co.
Smith & Furbush Mach. Co.
Whitin Machine Co.

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Roy & Son Co., B. S.
Smith & Furbush Mch. Co.
Whitin Machine Works.

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Phila. Textile Machy. Co.
Phila. Textile Machy. Co.
Schofield, Wm. Co.
Smith & Furbush Mch. Co.
Textile Finishing Mchy. Co., The

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(See Aprons.)

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McNaughton Mfg. Co.
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Peaslee-Gaulbert Co., Inc.
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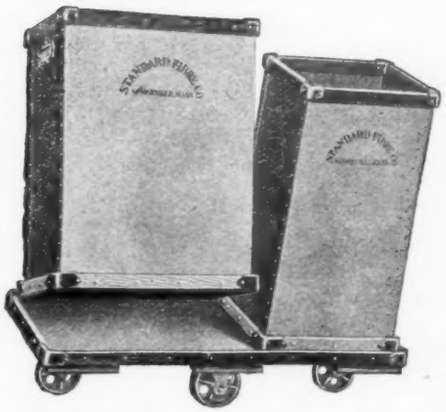

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Morse Chain Co.

Chairs and Stools
Wright Co.

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Electro Bleaching Gas Co.

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International Time Recorder Co.

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Wildman Mfg. Co.

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Link-Belt Company.

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Link-Belt Company.

Coal Handling Machinery.
Hunt Co., C. W.
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Coal Tar Disinfectants.
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Lunkenheimer Co.

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Compresses (Cotton).
Bridge & Co., Ltd., David
Southwark Fdry. & Machine Co.

Compression (High Density).
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Southwark Fdry. & Machine Co.

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Allis-Chalmers Mfg. Co.
General Electric Co.
Jones Mchry. Corp.
Pasco Tool Co.
Seeger-Walraven Co.
Seeger Machine Tool Co.

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Allis-Chalmers Mfg. Co.
Seeger Machine Tool Co.

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Westinghouse Elec. & Mfg. Co.

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American Supply Co.
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Collins, J. D.
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Coolers (Water).
(See Water Coolers.)

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Copper Stamps and Stencils.
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Carver-Beaver Yarn Co., Inc.
Fawcett, Hughes.
Southern Cotton Yarn Co.
Weimar Bros.
Woodward Baldwin & Co.

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Carpenter Co., Geo. B.
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Crymes Mchry. & Supply Co.
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Draper Corporation.
Firsching, J. A.
Fletcher Works.
Greenville Spool & Mfg. Co.
Howard & Bullough.
Jones Mchry. Corp.
Mill Supply Co. of Greenville.
Phila. Drying Mchy. Co.
Phila. Textile Machy. Co.
Sargent's Sons, Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Stafford Co.
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Whittinsville Spinning Ring Co.

Cotton Tape Loom.
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Schaum & Uhlinger.

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Veeder Mfg. Co.

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Allis-Chalmers Mfg. Co.

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Dehumidifying.
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American Kron Scale Co.

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Dictaphone Co.

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Dobby Chains.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

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Tagliabue Mfg. Co., C. J.
Lovingood Co.
Regnas & Co., J. R.

Draft Gauges and Thermometers.
Taylor Instrument Co.

Drawing Frames.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

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(See Electric Machinery.)

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Sturtevant Co., B. F.

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Pearson, Jos. T.

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Butterworth, H. W. & Sons Co.
Phila. Textile Mchry. Co.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The

Dust Collectors.
(See Blowers and Blowing Systems.)

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Schofield Co., Wm.
Smith & Furbush Mach. Co.

Dyers, Bleachers and Finishers.
American Processing Co.

Dyeing, Bleaching, Finishing and Printing Machinery.
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Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Permutit Co.
Phila. Drying Machinery Co.
Phila. Textile Machy. Co.
Refinite Co.
Reliance Machine Works.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The
Tolhurst Machine Works.

Dye Sticks.
Phila. Drying Machinery Co.

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Arabol Mfg. Co.
Atlantic Dyestuff Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Grasselli Chemical Co.
Hemingway Inc., Frank
Kali Mfg. Co.
Klipstein & Co., A.
Lewis, John D.
Metz & Co., H. A.
National Aniline & Chemical Co.
Newport Chemical Works, Inc.
Roessler & Hasslacher Chemical Co.
Sherwin-Williams Co.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques
Zavon, Inc.

Ejectors.
Sherwood Mfg. Co.

Electric Dynamos and Motors.
(See Motors and Generators.)

Electric Fans.
(See Fans—Electric.)

Electric Lamps.
(See Lamps.)

Electric Lamp Guards.
Flexible Steel Lacing Co.

Electric Signs.
Federal Sign System.

Electric Sirens.
Federal Sign System.

Electrical Engineers and Contractors.
Huntington & Guerry, Inc.
Imperial Electric Co.

Electrical Machinery and Supplies.
Allis-Chalmers Mfg. Co.
Carpenter Co., Geo. B.
Carter Electric Co.
Crymes Mchry. & Supply Co.
Economy Fuse & Mfg. Co.
Federal Sign System.
Imperial Electric Co.
Jones Mchry. Corp.
Luminous Specialty Co.
General Electric Co.
Seeger Machine Tool Co.
Seeger-Walraven Co.
Southern Textile Mchry. Co.
Walsh & Weidner Boiler Co.
Westinghouse Electric & Mfg. Co. Co.

Electrical Repairing (all kinds).
Jones Mchry. Corp.

Electric Tractors and Trucks.
(See Tractors & Trucks—Elec.)

Elevators.
Collins, J. D.
Hunt Co., C. W.
Link-Belt Company.
Seeger Machine Tool Co.

Enamel—Mill White.
(See Paint—Mill White.)

Engineers (Mill).
(See Architects.)

Engines—Oil, Gas and Gasoline.
Carpenter Co., Geo. B.
Crymes Mchry. & Supply Co.
Seeger Machine Tool Co.

Engines—Steam.
Allis-Chalmers Mfg. Co.
Carpenter Co., Geo. B.
Crymes Mchry. & Supply Co.
Jones Mchry. Corp.
Lombard Iron Works & Supply Co.
Schofield's Sons Co., J. S.
Toomey, Frank
Walsh & Weidner Boiler Co.

Engine Appliances—Oil and Steam.
Carpenter Co., Geo. B.
Crymes Mchry. & Supply Co.
Jenkins Bros.
Crane Co.
Jones Mchry. Corp.
Lunkenheimer Co.
Sherwood Mfg. Co.

Engine Room Supplies.
Carpenter Co., Geo. B.
Crane Co.
Crymes Mchry. & Supply Co.
Goodyear Tire & Rubber Co.
Jenkins Bros.
Jones Mchry. Corp.
Lunkenheimer Co.
Graton & Knight Mfg. Co.
Sherwood Mfg. Co.
Stewart Elec. Co., Jno. A.

Exporters (Cotton).
(See Brokers.)

Extractors—Hydro.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

Fans—Electric.
Allis-Chalmers Mfg. Co.
American Blower Co.
Carter Electric Co.
General Elec. Co.
Howard & Morse.
Westinghouse Elec. & Mfg. Co.

Fans—Conveying, Power and Exhaust.
(See Blowers and Blowing Systems.)

Feed Water Purifiers.
(See Water Softeners.)

Felting Machinery.
Smith & Furbush Mch. Co.

Fence—Steel and Iron.
Anchor Post Iron Works.
Belmont Iron Works.
Cyclone Fence Co.

Fibre Products.
Keystone Fibre Co.
Lane & Bros., W. T.
Leatheroid Sales Co.
Rogers Fibre Co.
Standard Fibre Co.

Filters—Water.
(See Water Softening.)

Finishing.
(See Dyers, Bleachers and Finishers.)

Finishing and Sizing Materials.
Arabol Mfg. Co.
Berne, Schrymser Co.
Bosson & Lane.
Corn Products Refining Co.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Alum. Co.
Grasselli Chemical Co.
Kali Mfg. Co.
Hemingway, Inc., Frank
Klipstein & Co., A.
Newport Chemical Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Roessler & Hasslacher Chemical Co.
Sherwin-Williams Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques
Zavon, Inc.

Fire Escapes (Spiral).
Collins, J. D.

Fire Hose.
(See Paint—Fireproof.)

Fire Protecting Paint.
(See Hose—Fire.)

First Aid Room Equipment.
(See Hospital Equipment.)

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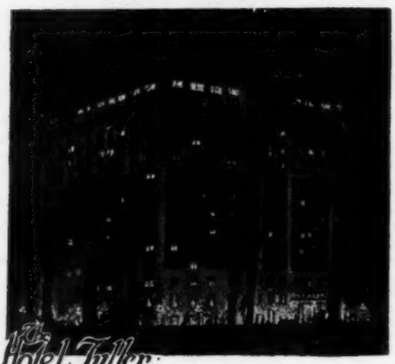

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Nashville Hardwood Flooring Co.
Floor Scrubbing Machine.
American Scrubbing Machine Co.

Fluted Rolls.
Howard & Bullough.
Saco-Lowell Shops.
Schofield's Sons Co., J. S.
Smith & Furbush Machine Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Flyers.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Fountains (Drinking).
Crane Co.
Mott-Southern Co.
Rundle-Spence Mfg. Co.

Friction Clutches.
(See Clutches—Friction.)

Fuses.
(See Elec. Mchy. and Supplies.)

Garnett Machines.
Roy Son Co., B. S.
Smith & Furbush Mach. Co.

Gas Engines.
(See Engines—Gas.)

Gaskets.
Graton & Knight Mfg. Co.

Gauge Cocks.
Lunkenheimer Co.

Gauges—Draft.
Taylor Instrument Co.

Gauges—Mercury Column Vacuum.
Taylor Instrument Co.

Gauges—Oil.
Lunkenheimer Co.

Gauges—Water.
Lunkenheimer Co.

Gears—Silent.
General Electric Co.
Link-Belt Company.
Morse Chain Co.

Gear Cutters.
Cresson-Morris Co.
Whitin Mch. Co., D. E.

Gear Pullers.
Greb Co., Inc.

Generators—Electric.
(See Motors and Generators.)

Graphite—Products.
Dixon Crucible Co., Jos.

Grates (Boiler).
Lombard Fdy. & Mch. Co.
McNaughton Mfg. Co.

Grease.
(See Lubricators.)

Grease Cups.
(See Lubricators.)

Grinders—Card, Cylinder Roll, Napper and Garnett.
(See Card Grinding Machinery.)

Guards (Elec. Lamp.)
Flexible Steel Lacing Co.

Guides (Thread).
Mitchell-Bissell Co.
Palmer Co., I. E.

Gums.
(See Finishing and Sizing Materials.)

Hangers.
(See Shafting and Hangers.)

Harness—Loom.
American Supply Co.
Crompton & Knowles Loom Wks.
Emmons Loom Harness Co.
Garland Mfg. Co.
Electro Bleaching Gas Co.

Heating and Ventilating Apparatus.
(See Ventilating Apparatus.)

Heddles.
Crompton & Knowles Loom Wks.
Draper Corporation.
Steel Heddle Mfg. Co.

Heddle Frames.
Crompton & Knowles Loom Wks.
Steel Heddle Mfg. Co.

Hoists.
Link-Belt Company.
Morse Chain Co.
Pasco Tool Co.
Seeger Machine Tool Co.

Hose—Fire.
Collins, J. D.
Goodyear Tire & Rubber Co.

Hosiery Dyeing Machinery.
Cocker Mch. & Fdry. Co.

Hosiery Finishing Boards.
(See Boards.)

Hosiery Forms.
(See Drying Forms.)

Hosiery Yarns.
(See Yarn Manufacturers.)

Hospital Equipment.
Thomas Co., F. H.
Wright Co.

Hotels.
Marquette.
Martinique.
Sinton.
Tuller.

Houses (Ready-Made).
(See Bungalows.)

Humidifying Apparatus.
American Blower Co.
Carrier Eng. Corp.
New York Blower Co.
Parks-Cramer Co.
Sturtevant Co., B. F.

Hydraulic Turbines.
(See Turbines—Steam.)

Hydro Extractors.
(See Extractors.)

Hydrometers.
Taylor Instrument Co.

Hygrometers.
Taylor Instrument Co.

Hygrodeiks.
Taylor Instrument Co.

Indicating and Recording Instruments.
Taylor Instrument Co.
Tagliabue Mfg. Co., C. J.

Indigo.
(See Dyestuffs and Chemicals.)

Injectors.
Lunkenheimer Co.
Sherwood Mfg. Co.

Ink—Stencil and Marking.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lovingood Co.
National Marking Machine Co.
Regnas & Co., J. R.

Iron Work—Ornamental.
Anchor Post Iron Works.
Belmont Iron Works.
Cyclone Fence Co.
Dufur & Co.
Lombard Iron Works & Supply Co.

Jacks.
Paulus, Chas. B.

Jacquards.
Crompton & Knowles Loom Wks.

Jute Bagging Machines.
Smith & Furbush Mach. Co.

Kettles—Size.
(See Size Kettles.)

Kettles—Soda.
Lombard Iron Works & Sup. Co.

Kiers.
(See Bleaching Kiers.)

Knit Goods.
(See Cotton Cloth Commission Merchants and Dealers.)

Knit Goods Washers.
(See Washers—Cloth.)

Knitting Machinery and Supplies.
Adams Co., Geo. H.
Boss Knitting Mach. Works.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Nye & Tredick Co.
Scott & Williams.
Smith & Furbush Mach. Co.
Wildman Mfg. Co.

Lamps—Incandescent and Arc.
Boston Economy Lamp Div.
Carter Electric Co.
Jones Mchry. Corp.
Crymes Mchry. & Supply Co.
General Electric Co.
Westinghouse Lamp Co.

Lamp Guards (Key Locking).
Flexible Steel Lacing Co.

Lamp Reflectors.
Carter Elec. Co.
Ivanhoe-Regent Works.
Luminous Specialty Co.

Landscape Architects.
(See Village Architects.)

Lappers.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Latch Needles.
Paulus, Chas. B.

Laundry Machinery.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Wks.

Lavatories.
Crane Co.
Mott Southern Co.

Leather Belting.
(See Belting.)

Leather Specialties.
American Supply Co.
Graton & Knight Mfg. Co.
Ladew & Co., Inc., Edw. R.
Williams & Sons, I. B.

Linen Yarns.
(See Yarns—Linen.)

Link Belting.
(See Belting—Link.)

Linters.
(See Waste Dealers.)

Liquid Chlorine.
(See Chlorine.)

Loaders—Wagon and Trucks.
Link-Belt Company.

Lockers (Metal).
Collins, J. D.

Logwood Extract.
(See Dyestuffs and Chemicals.)

Looms.
Crompton & Knowles Loom Wks.
Draper Corporation.
Fletcher Works.
Jones Mchry. Corp.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield, Wm. & Co.
Stafford Co., The
Whitin Machine Works.

Loom Attachments (Auto).
Draper Corp.

Lumber (See Building Material).

Lubricants.
Dixon, Jos., Crucible Co.
Kellogg & Co., E. H.
N. Y. & N. J. Lubricant Co.
Swan & Finch Co.

Lubricators.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.
Sherwood Mfg. Co.

Lug Straps.
(See Straps—Lug.)

Lunch Room Equipment.
(See Restaurant.)

Machine Tools.
(See Tools.)

Marking Pots, Stencils, Inks, Etc.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lovingood Co.
National Marking Machine Co.
Regnas & Co., J. R.

Marking Machines.
National Marking Machine Co.

Mercerized Yarns.
(See Yarns Mercerized.)

Mercerizing Machinery.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Metal Ceilings, Etc.
Belmont Iron Works.
Lupton's Sons Co., David

Metals (Perforated).
(See Screens and Sieves.)

Metal Workers—Sheet.
Belmont Iron Works.
Lombard Iron Works & Supply Co.

Meters—Flow, Air, Gas, Electric, Steam, Etc.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
General Electric Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.
Westinghouse Elec. & Mfg. Co

Meters (Revolution)
Taylor Instrument Co.

Mill Baskets and Boxes.
(See Boxes—Mill.)

Mill Engineer.
(See Architects and Engineers.)

Mill Villages.
(See Villages.)

Mill Supplies (Misc.).
(See Supplies—Mill).

Mill White Paint.
(See Paint—Mill White.)

Motors and Generators—Electric.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Crymes Mchry. & Supply Co.
General Electric Co.
Imperial Electric Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Seeger-Walraven Co.
Westinghouse Elec. & Mfg. Co.

Moving Picture Machines.
Lucas Theatre Supply Co.
Southern Theatre Equip. Co.

Mule Stands.
Transmission Ball Bearing Co.

Nails—Cement Coated.
Lovingood Co.
Regnas Co., J. R.

Nappers.
Roy & Son Co., B. S.

Needles—Latch.
Paulus, Chas. B.

Oils—Finishing
(See Finishing and Sizing Materials.)

Oils—Lubricating.
(See Lubricants.)

Oil Cups.
(See Lubricators.)

Oil Paper.
Bradley Mfg. Co., A. J.

Oiling Devices.
(See Lubricators.)
Inc.

Openers for Cotton, Wool, Waste Etc.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Oxidizing Machinery.
Phila. Drying Machinery Co.

Oxygen.
Bird Wilcox Co.
Commercial Acetylene Supply Co

Packings.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jenkins Bros.

Paint.
Atlanta Gas Light Co.
Barrett Co., The
Chaffee, Thos. K.
Detroit Graphite Co.
Du Pont de Nemours & Co., E. I.
Peaslee-Gaulbert Co., Inc.
Sherwin-Williams Co.
Vortex Mfg. Co.
Wadsworth, Howard & Co.

Paint—Preservative and Fireproof.
Atlanta Gas Light Co.
Barrett Co.
Detroit Graphite Co.
Du Pont de Nemours & Co., E. I.
Sherwin-Williams Co.
Peaslee-Gaulbert Co., Inc.
Vortex Mfg. Co.
Wadsworth, Howland & Co.

Paint—Mill White.
Chaffee, Thos. K.
Detroit Graphite Co.
Du Pont de Nemours & Co., E. I.
Peaslee-Gaulbert Co., Inc.
Sherwin-Williams Co.
Vortex Mfg. Co.
Wadsworth, Howland & Co.

Paper.
Bradley Mfg. Co., A. J.

Perforated Metal.
(See Screens and Sieves.)

Peroxides.
Rossler & Hasslacher Chemical Co.

Phonographs (Dictating).
Dictaphone Co.

Pickers—Curled Hair.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.

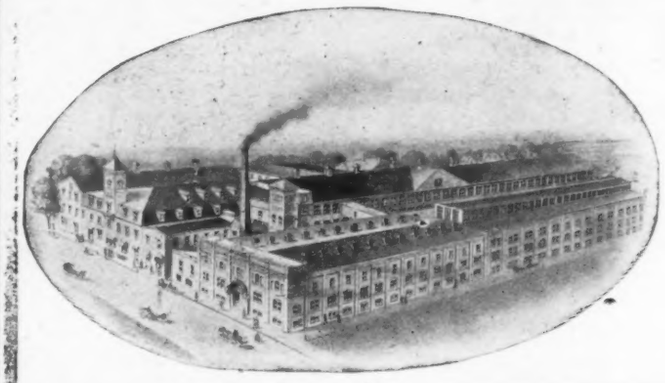
Pickers—Leather.
Garland Mfg. Co.

Picker Sticks.
Garland Mfg. Co

Picking Machinery.
Howard & Bullough, Am. Machine Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Pipe Fittings.
Crane Co.
Lunkenheimer Co.

Pipe Threading & Cutting Machines.
Seeger Machine Tool Co.
Seeger-Walraven Co.



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Hill-Standard Co.

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Aldrich Mch. Wks.
Allis-Chalmers Mfg. Co.
American Pulley Co.
Carpenter Co., Geo. B.
Cresson-Morris Co.
Crymes Mchry. & Supply Co.
Dodge Sales & Eng. Co.
General Electric Co.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Hyatt Roller Bearing Co.
Jones Mchry. Corp.
Kelly Co., Henry C.
Ladew & Co., Inc., Edw. R.
Link-Belt Company.
Morse Chain Co.
New Departure Mfg. Co.
Seeger Machine Tool Co.
Seeger-Walraven Co.
Stanley Belting Corp.
U. S. Ball Bearing Co.
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.

Presses.
American Laundry Machnry. Co.
Bridge & Co., Ltd., David
Butterworth & Sons Co., H. W.
Economy Baler Co.
Lovingood Co.
Phila. Drying Machine Co.
Reliance Machine Works.
Seeger Machine Tool Co.
Smith & Furbush Mch. Co.
Textile Finishing Machinery Co., The

Pulleys.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Seeger Machine Tool Co.
Seeger-Walraven Co.
Transmission Ball Bearing Co.

Pulley Covering.
Goodyear Tire & Rubber Co.
Stanley Belting Corp.
Williams & Sons, I. B.

Pumps.
Allis-Chalmers Mfg. Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Textile Finishing Machinery Co.
Walsh & Weidner Boiler Co., The
Toomey, Frank
Westinghouse Elec. & Mfg. Co.

Pump Valves.
(See Valve Discs.)

Psychrometers (Sling).
Taylor Instrument Co.

Pyrometers.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Quill Cleaning Machines.
Terrell Mch. Co.

Railings.
Dufur & Co.

Recording Instruments.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Reeds.
American Supply Co.
Emmons Loom Harness Co.

Reels.
Cocker Mch. & Fdry. Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Saco-Lowell Shops.
Schofield, Wm. Co.
Whitin Machine Works.

Reflectors (Lamp).
Carter Elec. Co.
Ivanhoe-Regent Works.
Luminous Specialty Co.
Stewart Elec. Co., Jno. A.

Regulators—Pressure.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Regulators—Temperature.
(See Temperature Controllers.)

Repairing (Electrical).
Jones Mchry. Corp.

Repairing—Textile of all kinds.
General Machine Works.
Southern Spindle & Flyer Co.

Restaurant Equipment.
Wright Co.

Rib Top Cutters.
General Machine Works.
Wildman Mfg. Co.

Ring Travelers—Steel and Bronze.
Whitinsville Spining Ring Co.
Whitin Machine Works.

Rings—Spinning.
(See Spinning Rings.)

Rocker Shaft Bearings.
(See Bearings.)

Rolls (Calender.)
Roy & Son Co., B. S.

Rolls—Steel.
Southern Spindle & Flyer Co.

Roofing.
Asphalt Roofing Co.
Atlanta Gas Light Co.
Barrett Co., The
Belmont Iron Works.
Cortright Metal Roofing Co.
Detroit Graphite Co.
Peaslee-Gaulbert Co., Inc.
Vortex Mfg. Co.
Wadsworth, Howland & Co.

Roofing Felt and Pitch.
Atlanta Gas Light Co.

Roof and Cement Coating.
Asphalt Roofing Co.
Atlanta Gas Light Co.
Barrett Co.
Detroit Graphite Co.
Du Pont de Nemours & Co., E. I.
Peaslee-Gaulbert Co., Inc.
Sherwin-Williams Co.
Vortex Mfg. Co.
Wadsworth, Howland & Co.

Rope—Transmission.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Hunt Co., C. W., Inc.
Kelly Co., Henry C.
Link-Belt Company.

Roving Cans and Trucks.
(See Cans—Roving.)

Roving Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Rubber Stamps.
(See Stamps, Stencils, Etc.)

Rubber Goods.
Goodyear Tire & Rubber Co.

Sanitary Products.
Crane Co.
Kaustine Co.
Mott-Southern Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.
Wright Co.

Sash-Window—Steel.
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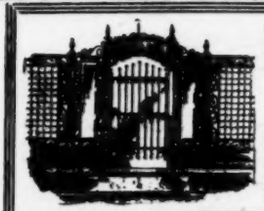

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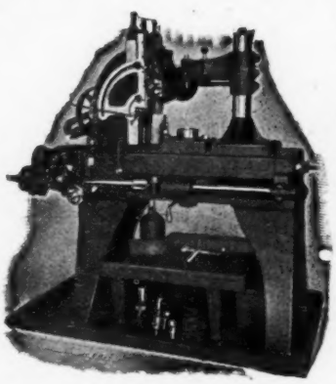

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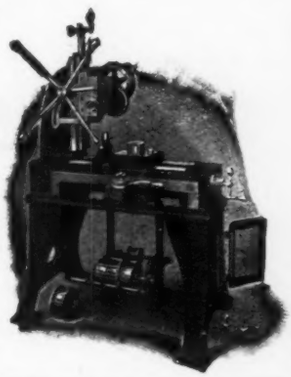

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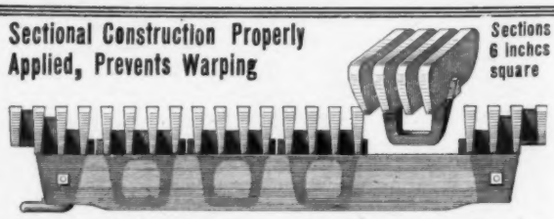

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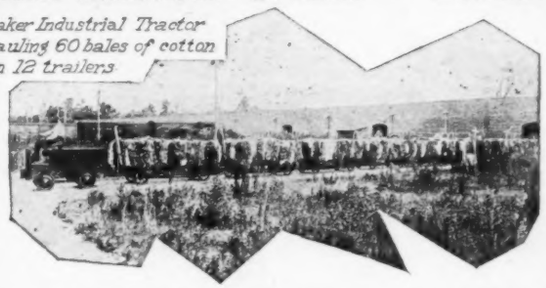

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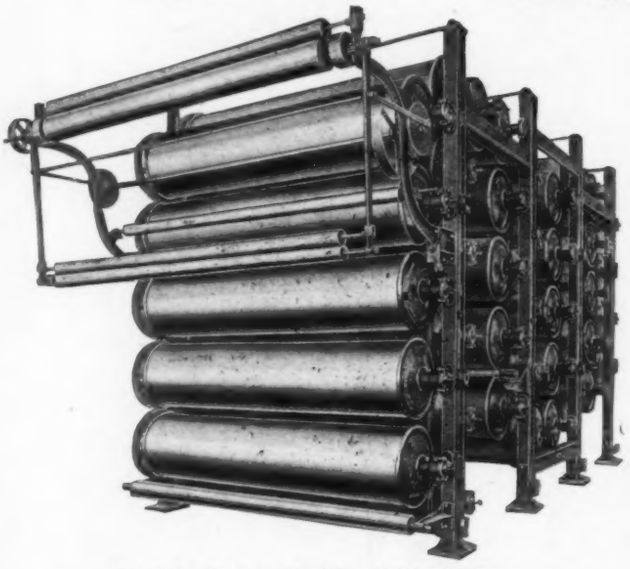

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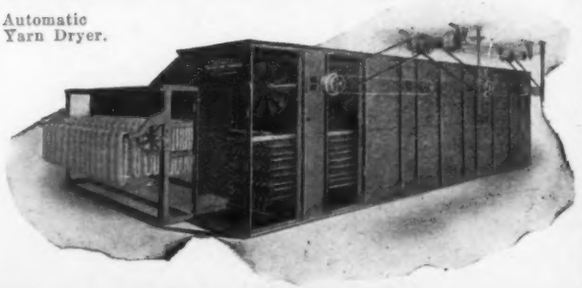

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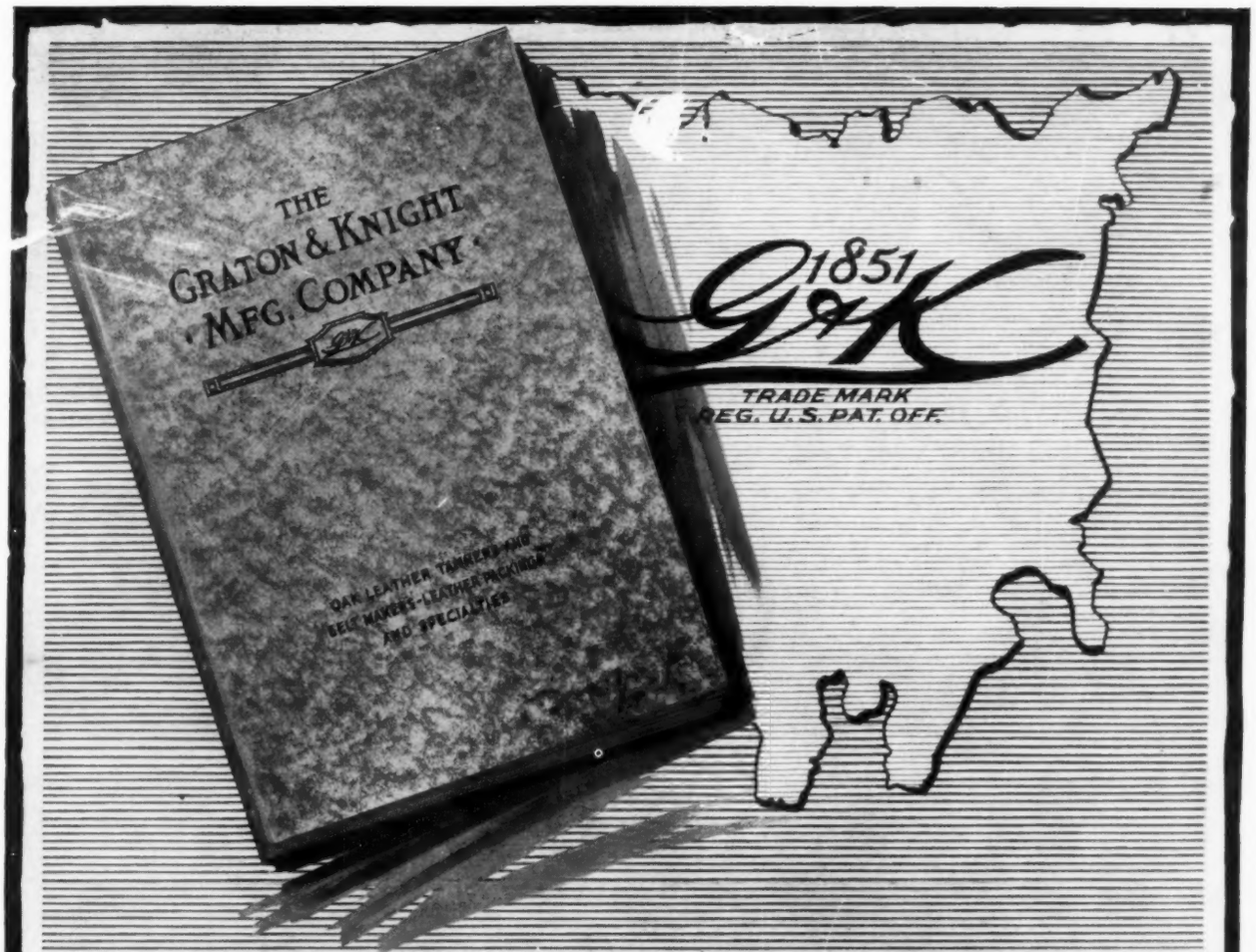

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